

# **Drug Enforcement Administration**

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# Microgram

## *Bulletin*

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JANUARY 2003

## Welcome to *Microgram Bulletin*

This is the first unclassified issue of *Microgram Bulletin*. Some background for our new subscribers: *Microgram* was started as a law enforcement restricted forensic chemistry newsletter in November 1967 by the Bureau of Drug Abuse Control (BDAC) and Bureau of Narcotics and Dangerous Drugs (BNDD). It was continued by the Drug Enforcement Administration (DEA) from 1973 to April 2002, when it split into *Microgram Bulletin* and *Microgram Journal* (the latter being dedicated to the publication of research articles).

This issue also marks the first electronic posting of *Microgram Bulletin* (and separately, of *Microgram Journal*). Both publications may be accessed at the following website:

<http://www.dea.gov/programs/forensicsci/microgram/index.html>

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### - INTELLIGENCE ALERT -

#### VERY LARGE ECSTASY LABORATORY SEIZED IN JAKARTA

The DEA Singapore Country Office and DEA Special Testing and Research Laboratory (Dulles, Virginia) recently assisted in the seizure of a very large MDMA/amphetamine operation in Tangerang, Jakarta, Indonesia. The laboratory was seized by the Indonesian National Police,



and consisted of a chemical synthesis laboratory and a separate tableting operation. The synthetic route to MDMA involved reductive amination of 3,4-methylenedioxyphenylacetone (MDP2P or PMK) with methylamine and sodium borohydride; the hydrochloride salt was produced by gassing an acetone solution of the free base with commercial hydrochloric acid gas. The amphetamine was synthesized via the Leuckart reduction route, and was crystallized as the sulfate salt. Small amounts of MDA were also produced by contamination of the amphetamine syntheses with MDP2P (and MDA was therefore identified in some of the resulting tablets). The production scale was 60 - 90 kilograms per batch, corresponding to 428,000 to 642,000 tablets per batch, based on a standard dosage unit of 140 milligrams of MDMA per tablet. Over 100 kilograms of MDMA hydrochloride (>90 percent purity), over 10 kilograms of amphetamine sulfate (>90 percent purity), over 100 kilograms of caffeine, and over 1.5 metric tons of MDP2P (determined to be of Chinese (PRC) manufacture) were seized at the site. Intelligence indicated that the laboratory had been in operation for approximately three years, and also that approximately 3.5 metric tons of MDP2P had already been processed prior to the laboratory's seizure.

The concomitant seizure of the tableting operation (and all its associated tablet dies) indicated that the operation was producing tablets with 23 different monograms. Source determination (toolmark) analysis indicated that fifteen of these monograms are connected through an unusual single scored tablet face (see Photo 1 and Table I), while the other eight were connected by an



Photo 1

## Table I - Descriptions of Monograms Depicted in Photo 1

**Lightning bolt** on blue, round (8.1-8.2 mm diameter) tablets, partial single score, biconvex, average tablet weight 210-230 mg/tablet;

**“dR”** on orange or green, round (8.1-8.3 mm diameter) tablets, partial single score, biconvex, average tablet weight 200-210 mg/tablet;

**Outline of squirrel** on yellow, round (8.1 mm diameter) tablets, partial single score, flat/convex, average tablet weight 210 mg/tablet;

**Outline of apple** on green, round (8.1 mm diameter) tablets, partial single score, biconvex, average tablet weight is 210 mg/tablet;

**“2000”** on green or blue, round (8.1-8.3 mm diameter) tablets, partial single score, biconvex, average tablet weight 210-230 mg/tablet;

**“ABC”** on blue, round (8.1-8.2 mm diameter) tablets, partial single score, biconvex, average tablet weight 210 mg/tablet;

**“U2”** on orange, round (8.1-8.2 mm diameter) tablets, partial single score, biconvex, average tablet weight 210 mg/tablet;

**“J-A”** on orange, round (8.1 mm diameter) tablets, partial single score, biconvex, average tablet weight 210 mg/tablet;

**Stylized flying horse** on orange, round (8.1-8.2 mm diameter) tablets, partial single score, biconvex, average tablet weight is 210 mg/tablet;

**Honda “H” company trademark** on orange or green, round (8.1 mm diameter) tablets, partial single score, biconvex, average tablet weight is 200-250 mg/tablet;

**Chili peppers** on orange or green, round (8.1 mm diameter) tablets, partial single score, biconvex, average tablet weight is 205-210 mg/tablet;

**Outline of heart** on pink, round (8.1 mm diameter) tablets, partial single score, biconvex, average tablet weight 210 mg/tablet;

**Stylized lobster (or fish)** on red, round (8.1-8.2 mm diameter) tablets, partial single score, biconvex, average tablet weight is 210 mg/tablet;

**Toyota company trademark** on red, round (8.1 mm diameter) tablets, partial single score, biconvex, average tablet weight is 210 mg/tablet;

**no monogram** (partial single score on each side) on pink or brown, round (8.1 mm diameter) tablets, partial single score, biconvex, average tablet weight is 210-250 mg/tablet;

**“234”** on orange or blue, round (8.1-8.3 mm diameter) tablets, partial single score, biconvex, average tablet weight 205-210 mg/tablet.

unscored tablet face (see Photo 2 and Table II). Most of the tablets contained a mixture of MDMA and caffeine; some also contained from trace to small amounts of amphetamine and MDA. Additional seizures submitted to the Special Testing and Research Laboratory's Source Determination Program indicated widespread distribution of these tablets in the United States, Australia, Myanmar (Burma), the People's Republic of China, and elsewhere.



Photo 2

**Table II - Descriptions of Monograms Depicted in Photo 2**

**“?” [question mark]** on green, round (8.1-8.2 mm diameter) tablets, unscored, flat/beveled, average tablet weight is 240 mg/tablet;

**Outline of butterfly** on blue, round (8.1 mm diameter) tablets, partial single score, flat/convex, average tablet weight 205 mg/tablet;

**Stylized flying dove or peace dove symbol** on light blue, round (8.2 mm diameter) tablets, unscored, flat/beveled, average tablet weight is 235 mg/tablet;

**“A1”** on brown, round (8.0-8.1 mm diameter) tablets, unscored, flat/beveled, average tablet weight is 210 mg/tablet;

**Stylized Chanel company trademark (double Cs, back-to-back and overlapping)** on red, round (8.1 mm diameter) tablets, unscored, flat/beveled, average tablet weight is 240 mg/tablet;

**“FOR” and “YOU” in two lines** on pink, round (8.1 mm diameter) tablets, unscored, flat/beveled, average tablet weight is 200 mg/tablet;

**“KISS” inside lips** on orange, round (8.1 mm diameter) tablets, unscored, flat/beveled, average tablet weight is 220 mg/tablet;

**Stylized horseshoe (Etienne Aigner company trademark; stylized “A” and “E”)** on orange, round (8.1-8.2 mm diameter) tablets, unscored, flat/beveled, average tablet weight is 240 mg/tablet.

**- INTELLIGENCE ALERT -**

**KETAMINE ON SUGAR CUBES IN CARROLL COUNTY, MARYLAND**

The Maryland State Police Crime Laboratory (Pikesville, Maryland) recently received a submission of 34 sugar cubes, each individually wrapped in aluminum foil, suspected LSD (see Photo 3). The exhibits were discovered by a mechanic who was performing a state inspection on a vehicle, and were turned over to Maryland State Police. The cubes were white, standard sized, and had no outward discoloration. However, they did not fluoresce under ultraviolet light, and analysis of a chloroform extract by GC/MS, GC/FID, and UV spectrometry indicated not LSD but rather ketamine. This is the first time the Crime Laboratory has received a submission of ketamine-laced sugar cubes.



Photo 3

[Editor's Notes: According to the analyst, submissions of aluminum foil-wrapped sugar cubes to the Crime Laboratory are not unusual; however, most such submissions contain LSD. This likewise appears to be the first exhibit of ketamine-laced sugar cubes reported to *Microgram Bulletin*.]

\* \* \* \* \*

**- INTELLIGENCE ALERT -**

**MDMA "MIMIC" ASPIRIN TABLETS IN EASTERN OHIO**

The DEA North Central Laboratory (Chicago, Illinois) recently received 60 yellow tablets with a raised heart logo on one side, suspected Ecstasy (MDMA) (see Photo 4). The tablets were purchased in and nearby Warren, Ohio, by agents from the DEA Youngstown Resident Office, and were round and biconvex, measuring 7.5 mm x 4.5 mm x 2.1 mm, weighed 185 milligrams each, and were film coated with a white interior. Analysis by MS and IR, however, indicated not MDMA but rather aspirin (not quantitated).



Photo 4

[Editor's Notes: DEA/Youngstown indicates that these tablets are frequently sold as Ecstasy in eastern Ohio and neighboring regions. Interestingly, this product does not appear to be



listed in the FDA database for approved Over-the-Counter medications. However, an inquiry on a national pharmacists' list server indicated two manufacturers of this or highly similar products, Smart Pharmaceuticals, Inc. (Vancouver, Washington), and TimeCap Labs, Inc. (Farmingdale, New Jersey). In both cases, the tablets contain 81 milligrams of aspirin, and are intended for use as "preventive medicine" against heart attacks (this information courtesy of Dr. Donald H. Williams, Executive Director, Washington State Board of Pharmacy).]

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### HEROIN SUITCASE FRAMEWORK-LINERS IN MIAMI, FLORIDA

The DEA Southeast Laboratory (Miami, Florida) recently received a large green suitcase with an internal framework-liner consisting of a hard, reddish colored, woodlike material, suspected to contain heroin (see Photo 5). The suitcase was seized at the Miami International Airport by the U.S. Customs Service from a passenger arriving from Cali, Colombia. The net mass of the removed material was about 3.64 kilograms. Analysis by GC, GC/MS, and FTIR-ATR confirmed 52 percent heroin hydrochloride and lidocaine (not quantitated). The supporting matrix was soluble in methylene chloride, but not in methanol, and was suspected to be a non-polar polymer (not further identified).



Photo 5

\* \* \* \* \*

### PIPERAZINE MIXTURE TABLETS IN CHICAGO, ILLINOIS

The Cook County Sheriff's Police Department Forensic Laboratory (Maywood, Illinois) recently received 150 rose-colored tablets, imprinted with the Chanel logo, suspected 3,4-methylenedioxymethamphetamine (MDMA) (see Photo 6). The tablets were seized by the Cook County Sheriff's Police Department in Chicago from two Bosnian nationals, and were allegedly from the Philadelphia area. The tablets were approximately 10 x 4 millimeters, weighed approximately 450 milligrams each, and had a moist "mash" consistency rather than the standard dry powder form. Analysis by GC/MS, however, indicated not MDMA but rather a mixture of 1-benzylpiperazine (BZP), 1-(3-trifluoromethylphenyl)piperazine (TFMPP), and *ortho*-methoxyphenylpiperazine.



Photo 6

Standards of all three chemicals were acquired and submitted to GC/MS analyses to confirm the identifications (see Figures 1 - 3 on pages 8, 9, and 10). This was the Forensic Laboratory's first encounter with these type tablets.

The following articles and Intelligence Briefs have more information about one or more of the above chemicals:

- 1) Legal Ecstasy (MDMA)? Forensic Drug Abuse Advisor 2001;13(8):60.
- 2) BZP and TFMPP: Chemicals Used to Mimic MDMA's Effects. Microgram Bulletin 2002;35(5):123.
- 3) deBoer D, et al. Piperazine-like Compounds: A New Group of Designer Drugs-of-Abuse on the European Market. Forensic Science International 2001;21(1-2):47.
- 4) Recent Notifications Concerning BZP, TFMPP, 2C-T-7, and GBL. Microgram Bulletin 2002;35(7):177.
- 5) Unusual Piperazine Mixture in Alliance, Ohio. Microgram Bulletin 2002;35(8):190.

[Editor's Notes: These tablets appear to be quite similar to those reported in the next Intelligence Brief, below. Note that a compact red powder also containing a similar mixture of these same three piperazines was reported in the August 2002 issue of *Microgram Bulletin*. That exhibit was seized in Alliance, Ohio (Reference 5 above). Also note that *ortho*-methoxyphenyl-piperazine is sometimes referred to as "OMP"; however, this terminology has not yet been widely accepted.]

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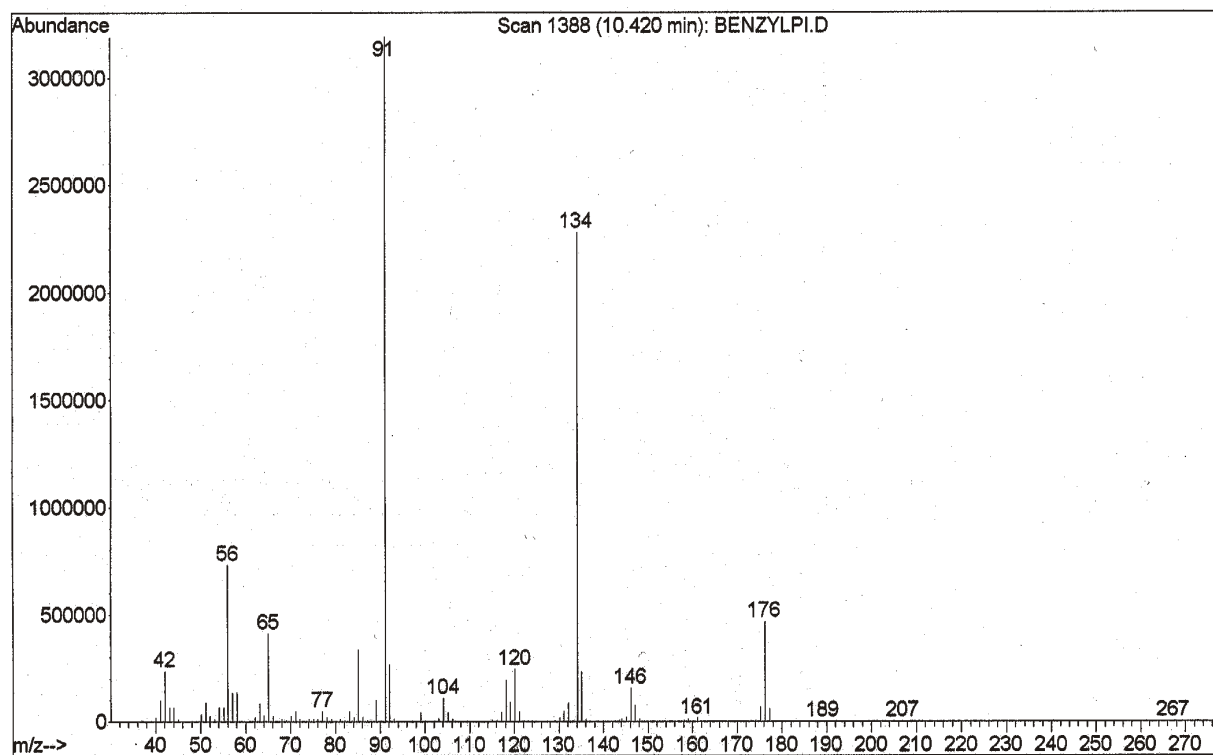
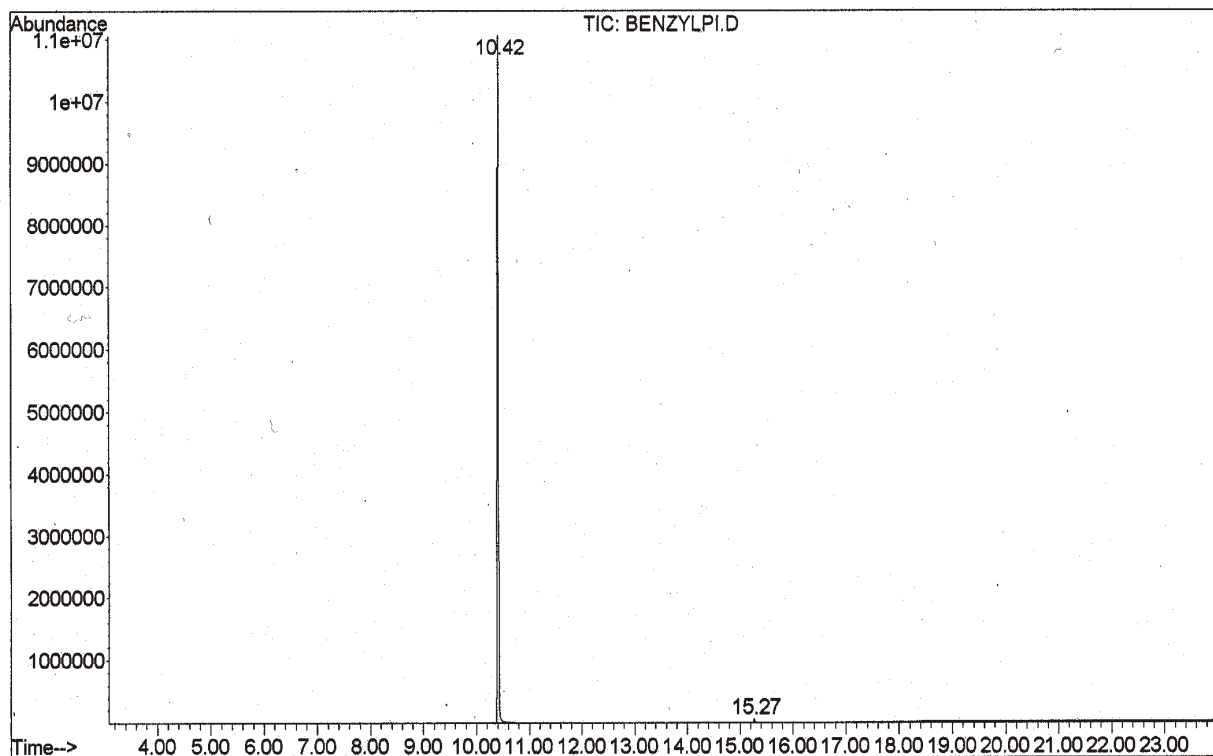
#### **PIPERAZINE MIXTURE TABLETS IN THE BALEARIC ISLANDS (SPAIN)**

The Laboratory of Drugs in The Balearic Islands (Spain) recently received five round red tablets (net mass 2.296 grams) with an unidentifiable logo on one side and single score on the opposite side, suspected Ecstasy (MDMA) (photo not available). The tablets were seized by the Guardia Civil at a beachside disco on Ibiza Island. Analysis by GC-FID and GC/MS, however, indicated not MDMA but rather a mixture of 1-benzylpiperazine (BZP), 1-(3-trifluoromethylphenyl)-piperazine (TFMPP), and methoxyphenylpiperazine (isomer not determined). This was the first submission of these type tablets to the Laboratory of Drugs. Two small, noncommercial bottles of ketamine were also seized with the tablets. None of the exhibits were quantitated.

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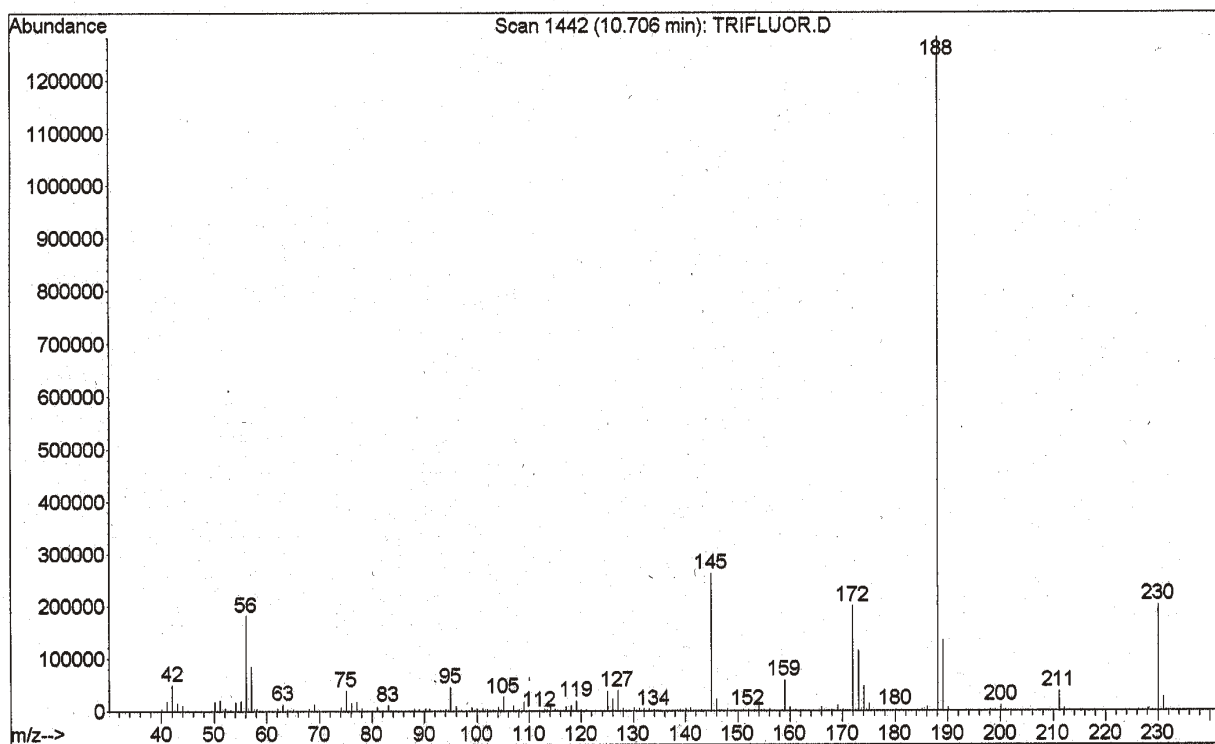
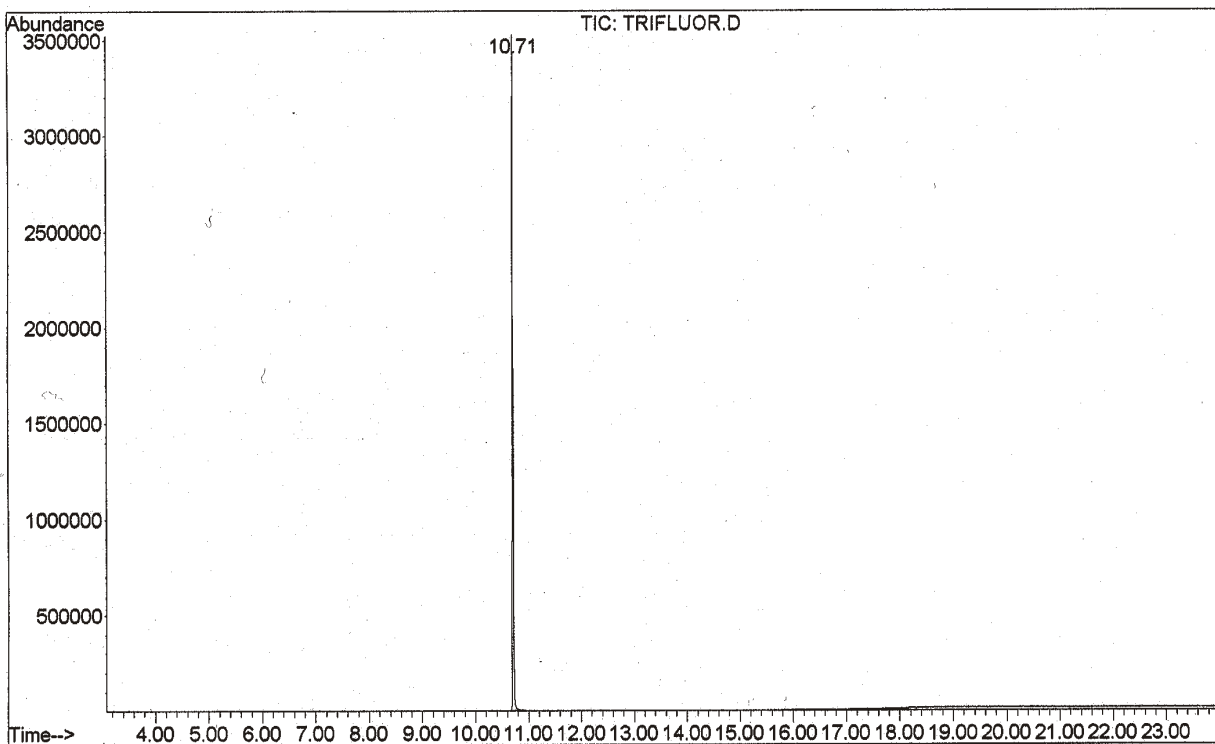
Figures 1a - b

Total Ion Chromatogram and Mass Spectra of 1-Benzylpiperazine (BZP)



Figures 2a - b

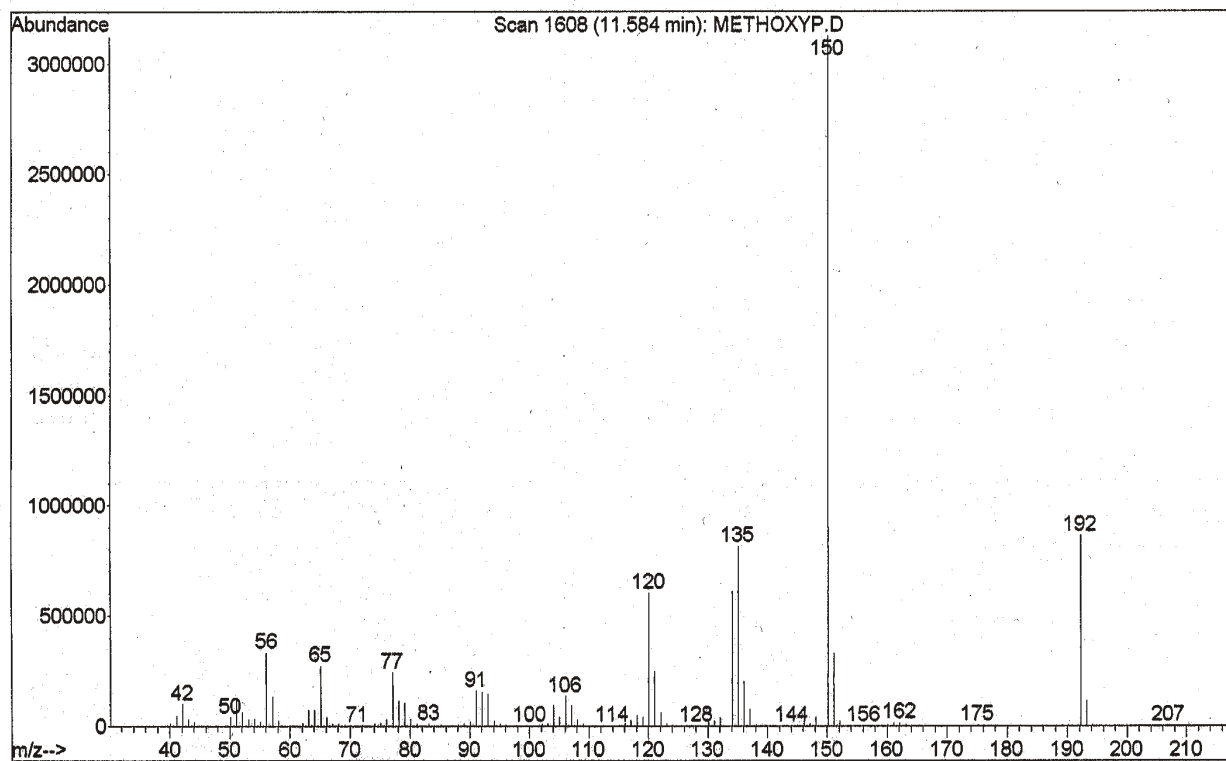
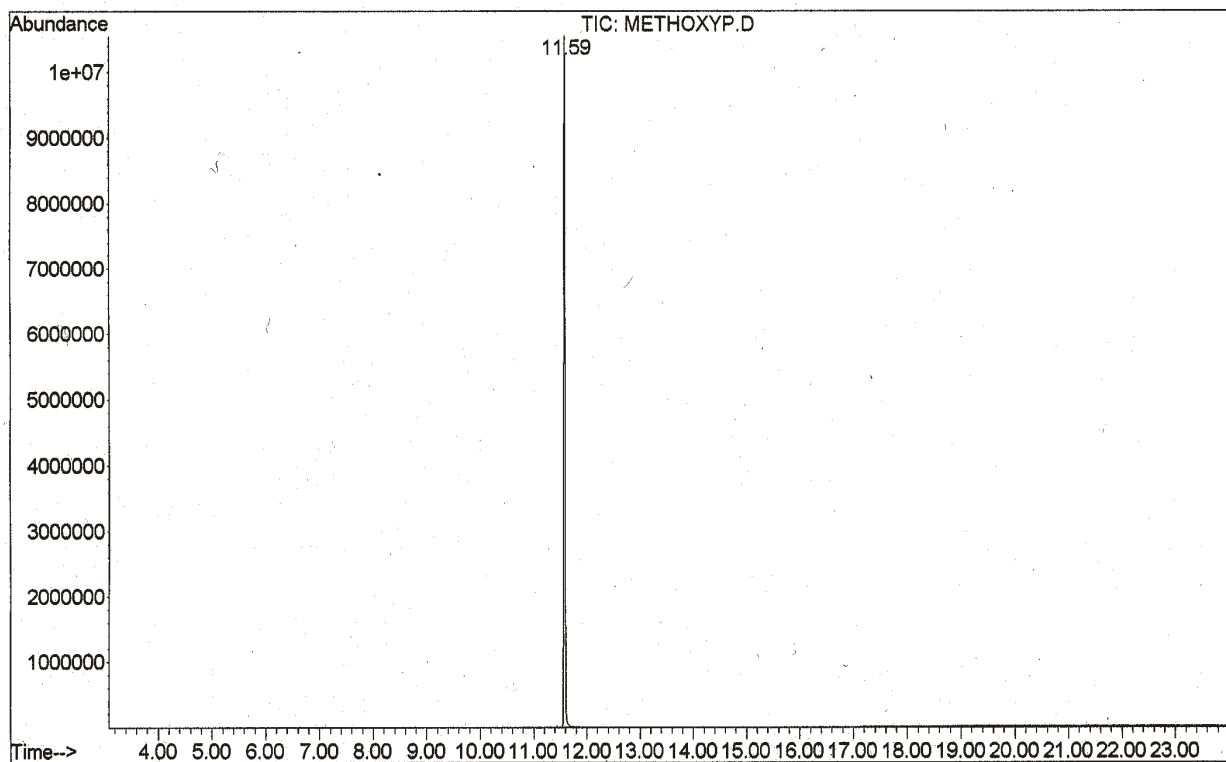
Total Ion Chromatogram and Mass Spectra  
of 1-(3-Trifluoromethylphenyl)piperazine (TFMPP)





Figures 3a - b

Total Ion Chromatogram and Mass Spectra of *ortho*-Methoxyphenylpiperazine

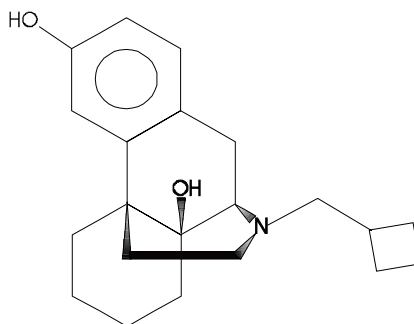


## Technical Communication

### Butorphanol

**Eric L. Jordan and Allen J. Catterton**  
**Drug Enforcement Administration**  
**Southeast Laboratory**  
**5205 N.W. 84th Avenue**  
**Miami, FL 33166**

Butorphanol tartrate is an opioid agonist-antagonist analgesic used for pain management in humans and is marketed under the brand name Stadol NS<sup>®</sup> (Bristol-Myers Squibb Co.) For veterinary use, butorphanol is prescribed as an analgesic and antitussive under the trade names Torbutrol<sup>®</sup> (Fort Dodge) and Torbugesic<sup>®</sup> (Fort Dodge).<sup>1,2,3</sup>



**Butorphanol<sup>4</sup>**

Chemical Name: 17-(Cyclobutylmethyl)morphinan-3,14-diol

Chemical Formula:  $C_{21}H_{29}NO_2$ ; M.W. = 327.5

(Tartrate) =  $C_{21}H_{29}NO_2 \cdot C_4H_6O_6$ ; M.W. = 477.6

CAS #: [042408-82-2]

(Tartrate) = [58786-99-5]

Melting Point (Tartrate) = 217 – 219° C

Therapeutic Category (Human): Analgesic (Narcotic)

(Veterinary): Analgesic, Antitussive

Solubility (Tartrate) = Soluble in dilute acid; slightly soluble in water and methanol, practically insoluble in ethanol, chloroform and ether.<sup>5</sup>

### Commercial Butorphanol Preparations

#### Human

Stadol<sup>®</sup> (Bristol-Myers Squibb Co) - Butorphanol tartrate injection: 1 mg/mL in 1 mL vial; 2 mg/mL in 1, 2, and 10 mL vials.

Stadol NS<sup>®</sup> (Bristol-Myers Squibb Co) - Butorphanol nasal spray: 10 mg/mL.

## Animal

Torbutrol<sup>®</sup> (Fort Dodge) - Butorphanol tartrate injection: 0.5 mg/mL; 10 mL vials.

Torbutrol<sup>®</sup> (Fort Dodge) - Butorphanol tartrate tablets: 1 mg, 5 mg (Figures 1 and 2), and 10 mg tablets; bottles of 100.

Torbugesic<sup>®</sup> (Fort Dodge) - Butorphanol tartrate injection: 10 mg/mL; 50 mL vials (Figure 3).

## **Instrumentation and Supplies**

Mass spectra (Figures 4 and 5) were obtained on a Hewlett-Packard 6890 GC /5973 MSD using a HP 5MS, 5% phenyl methyl siloxane, 30 m (length) x 0.25 mm (internal diameter) x 0.25  $\mu$ m (film thickness) column. Temperature programming began at 120°C for 0.80 minutes, followed by a ramped run at 25°C per minute to 300°C, where the temperature was held for 2 minutes. Column flow was 1.2 mL per minute with an average velocity of 41 cm per second. The inlet was set on a 100:1 split mode with an initial temperature of 250°C. The total inlet flow was 122.6 mL per minute. The scan parameters were set at a Low Mass of 35 amu, High Mass of 500 amu, and a threshold of 150.

Fourier transform infrared spectra (Figures 6, 7 and 8) were obtained with a Nicolet Magna 560 with a potassium bromide (KBr) beamsplitter and a Deuterated Triglycine Sulfate (DTGS) KBr detector. A Durascope Dicom<sup>™</sup> ATR accessory with a 3-bounce Diamond ATR element was also utilized. KBr was IR grade. The resolution was set at 4.000  $\text{cm}^{-1}$  for 32 scans between 4000  $\text{cm}^{-1}$  and 550  $\text{cm}^{-1}$ . The mirror velocity was 0.6329 cm per second.

Vapor phase infrared spectra (Figure 9) were obtained with a 6890 GC/BioRad IRD II Infrared Detector using a HP 5, 5% phenyl methyl siloxane, 25 m x 0.32 mm x .52  $\mu$ m column. The temperature parameters began at 50°C for 1.50 minutes, followed by a ramped run at 35°C per minute to 290°C, where the temperature was held for 3 minutes. Column flow was 1.5 mL per minute with an average velocity of 28 cm/sec. The inlet was set at a splitless mode with an initial temperature of 260°C. The purge gas was nitrogen at 50.0 mL per minute.

Nuclear magnetic resonance (NMR) spectra (Figures 10, 11, and 12) were obtained with a Varian Gemini 300 Nuclear Magnetic Resonance Spectrometer (FT-NMR, 300 MHz). A 1D observed proton experiment was run for each sample, with the number of transients set to 64. Deuterated chloroform ( $\text{CDCl}_3$ ), deuterated methanol ( $\text{CD}_3\text{OD}$ ), and deuterated water ( $\text{D}_2\text{O}$ ) were all obtained from Aldrich.

The butorphanol tartrate standard was supplied by Sigma-Aldrich (lot number 47H1023), with a purity stated at 99.4 percent. Conversion to the free form base was accomplished by dissolution in 1N NaOH (aq) with subsequent extraction with  $\text{CDCl}_3$  for the NMR and  $\text{CH}_2\text{Cl}_2$  for the GC/IRD and FTIR. The extraction for the FTIR was dried over 50°C on the heated ATR plate.

## **Discussion**

Effective October 31, 1997, butorphanol, including its salts and optical isomers, was placed into Schedule IV of the Controlled Substances Act (CSA), Section 1308.14, paragraph (f) (2).<sup>2,6</sup> This action was in response to increasing reports of diversion and abuse of butorphanol following the introduction of the

Stadol NS nasal spray in 1992.<sup>1</sup> For example, in the March 1997 issue of *Microgram*, the Division of Forensic Science in Roanoke, Virginia reported an increase in the number of Stadol NS nasal spray submissions.<sup>7</sup> Significantly, veterinary prescriptions of butorphanol have also been subject to abuse. In one such case, a woman was found to be taking her dog to various veterinarians and providing false statements attesting to the canine's cough and collapsing trachea (ailments were consistent with a therapeutic regimen requiring Torbutrol<sup>®</sup>). In this manner, the perpetrator obtained 7,568 dosage units in 180 visits to veterinarians.<sup>9</sup> Following her arrest, a DEA Diversion Investigator involved with the case reported that the tablets were being dissolved in water and the resulting solution injected with a hypodermic syringe. The Investigator also reported the scene as being rife with drug paraphernalia, and also that friends of the subject had been solicited into the scheme.

Not surprisingly, butorphanol has also been linked to recreational drug use. Tennessee veterinarian Timothy A. Williams, DMV, whose office is close to a college campus, has had to rigorously restrict butorphanol prescriptions to clients with valid veterinary requirements, and then only after a valid patient-client-veterinarian relationship has been established, due to recreational abuse by the students. According to Dr. Williams, butorphanol is colloquially referred to by the students as "Torbo."



Figure 1 - Torbutrol<sup>®</sup> 5mg

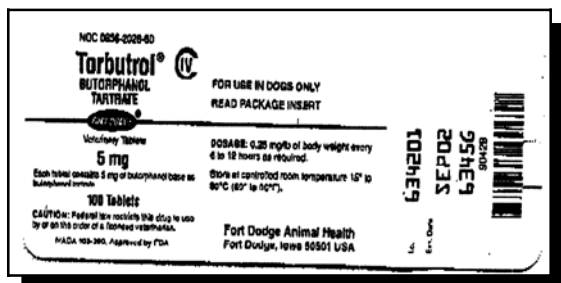


Figure 2 - Torbutrol<sup>®</sup> Packaging



Figure 3 - Torbugesic<sup>®</sup> Packaging

Note: Pictures of Stadol are also available in Physicians' Desk Reference, 53<sup>rd</sup> Edition

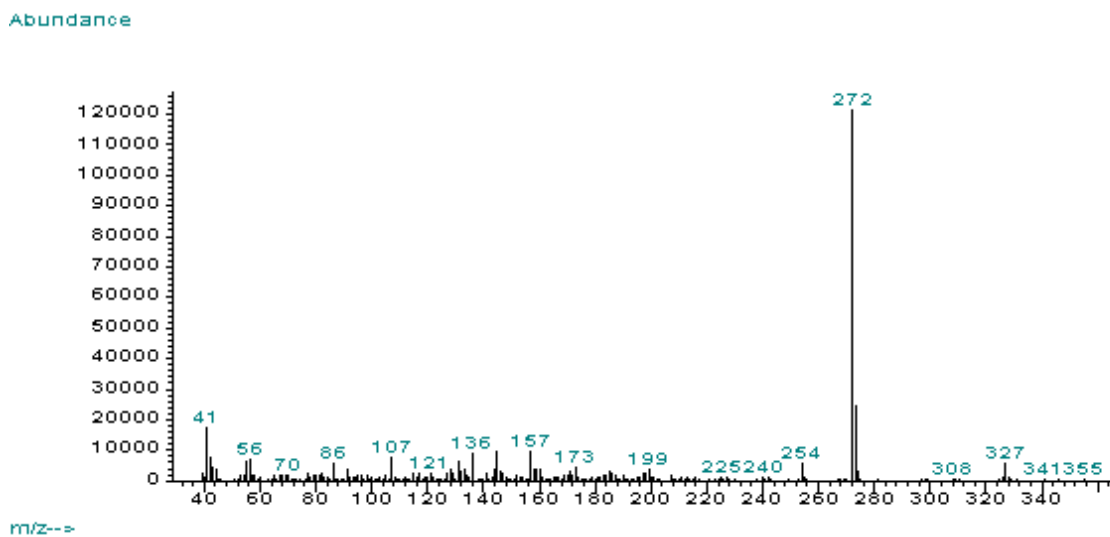


Figure 4 – Mass Spectrum of Butorphanol

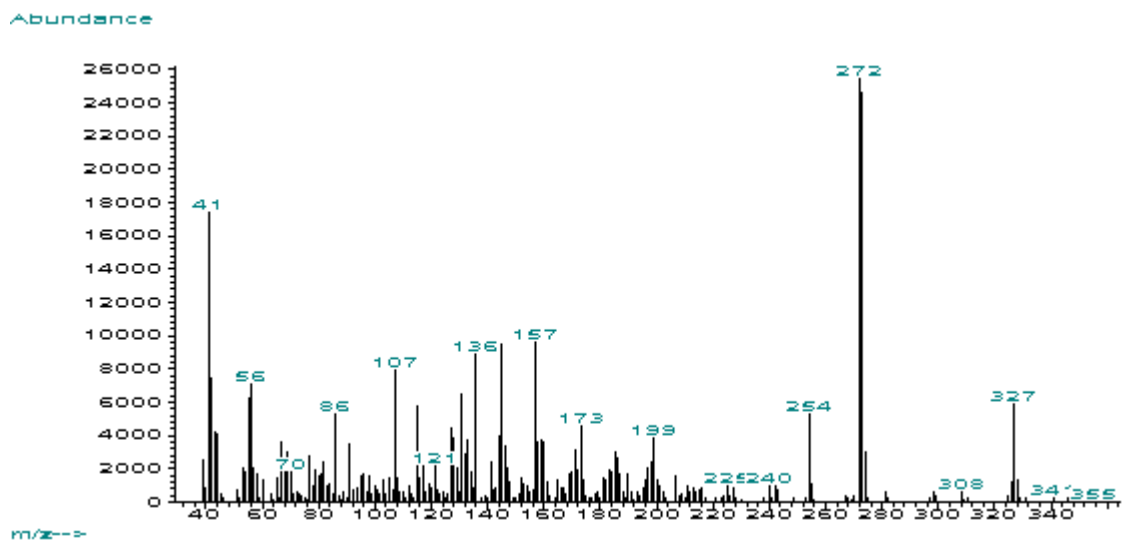


Figure 5 – Mass Spectrum of Butorphanol (Normalized to the 273 ion)

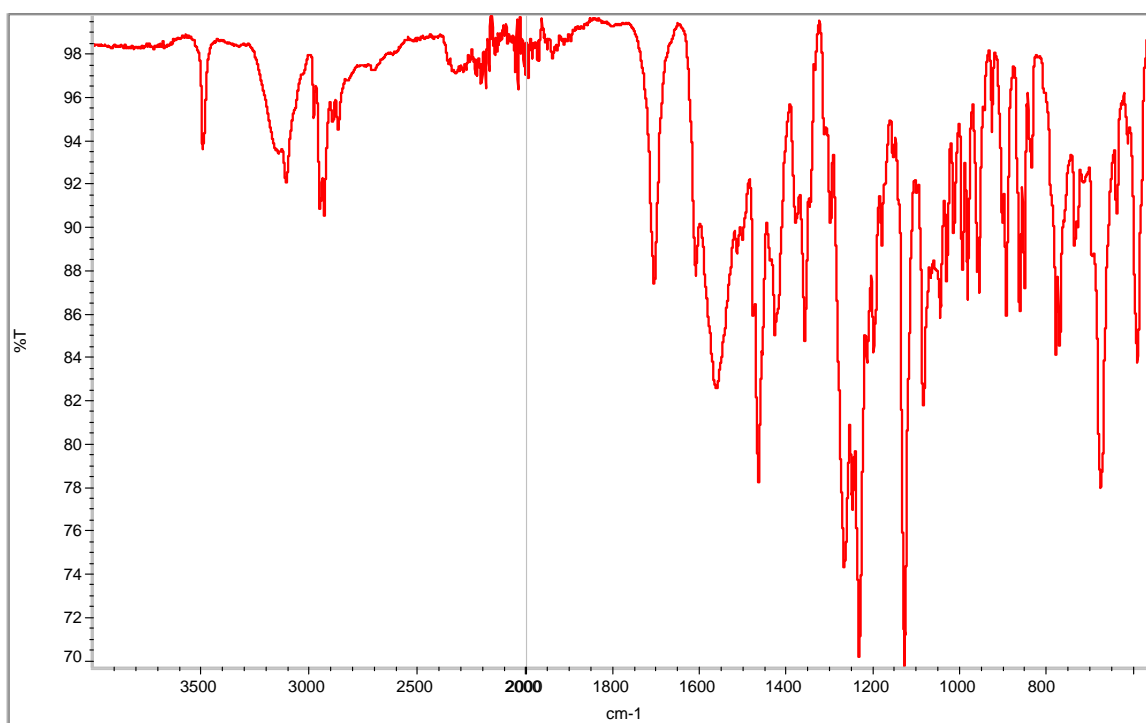


Figure 6 – Infrared Spectrum of Butorphanol Tartrate on 3 - bounce Diamond ATR

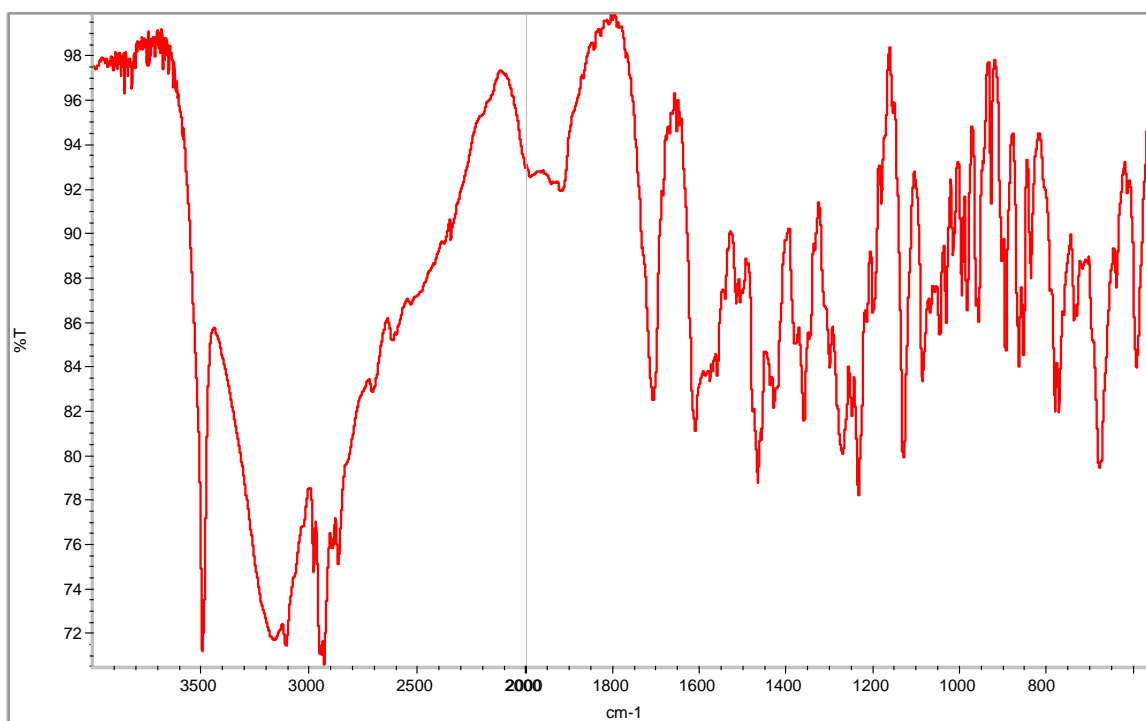


Figure 7 – Infrared Spectrum of Butorphanol Tartrate KBr pellet

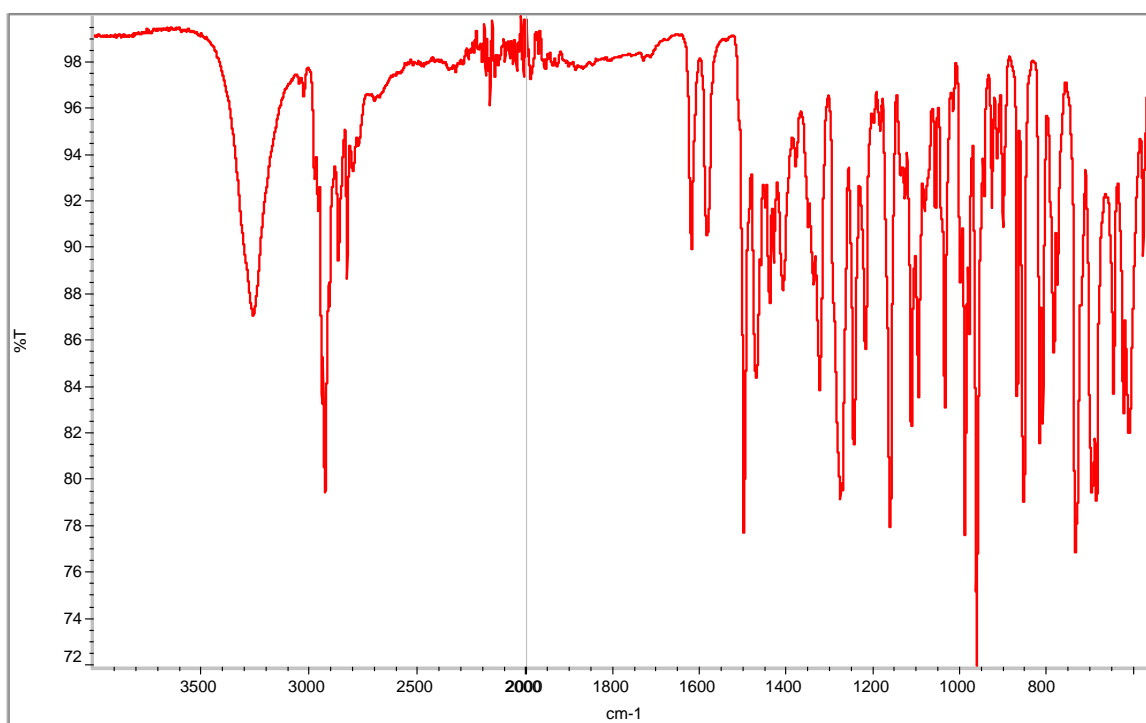


Figure 8 - Infrared Spectrum of Butorphanol on 3 - bounce Diamond ATR

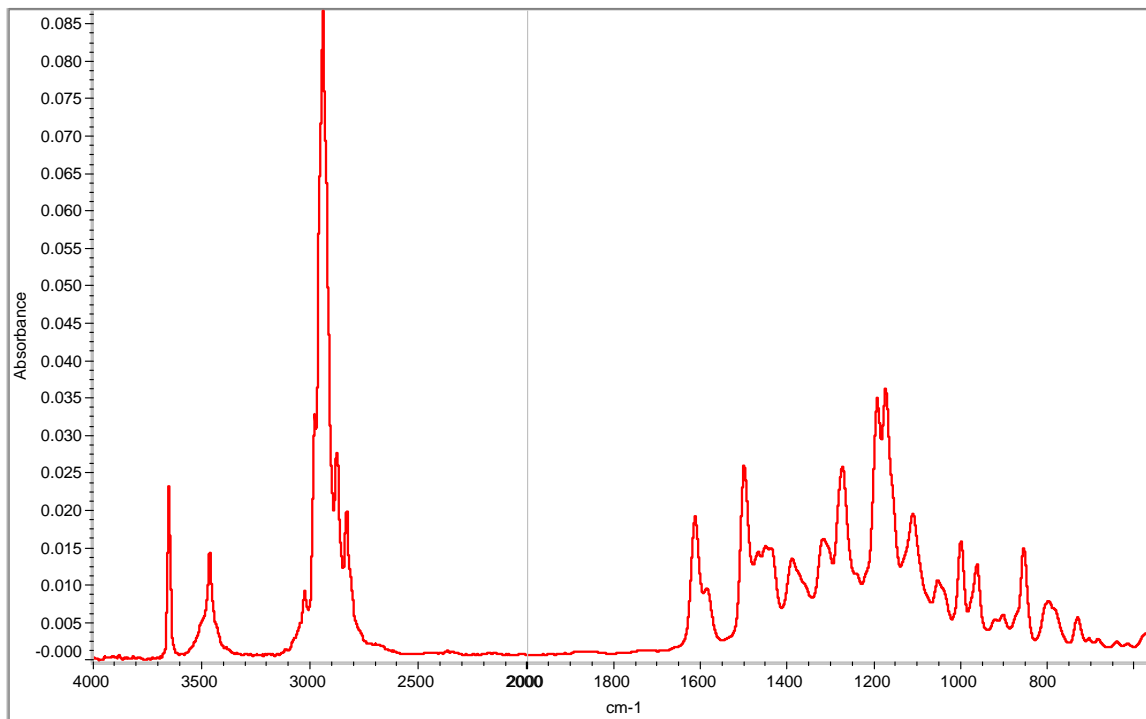


Figure 9 – Vapor Phase Infrared Spectrum of Butorphanol

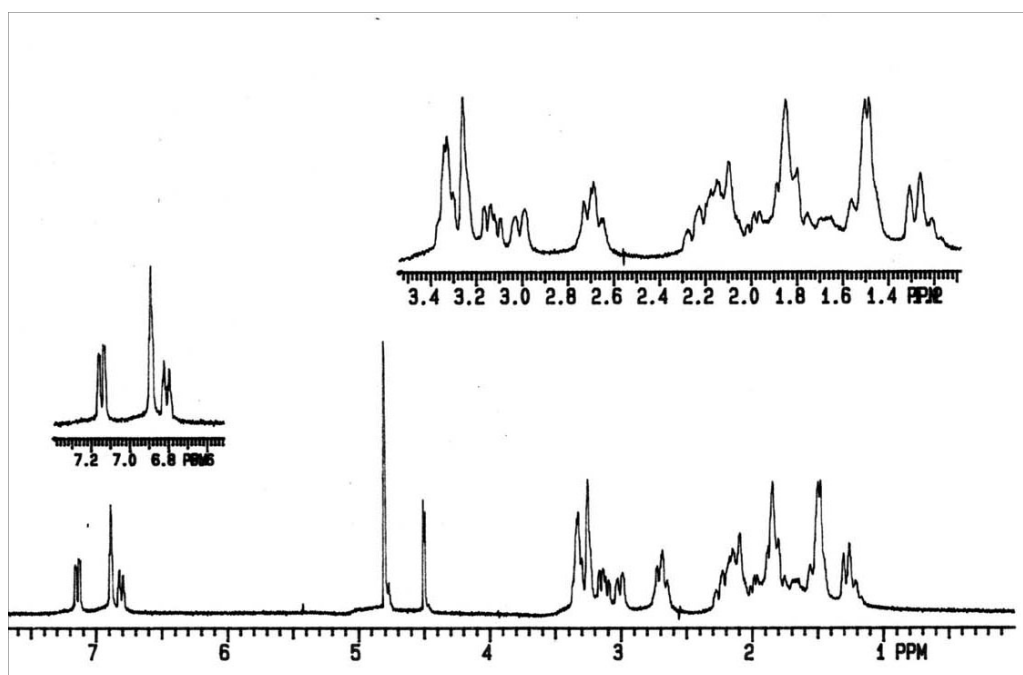


Figure 10 – NMR spectrum of Butorphanol Tartrate in D<sub>2</sub>O

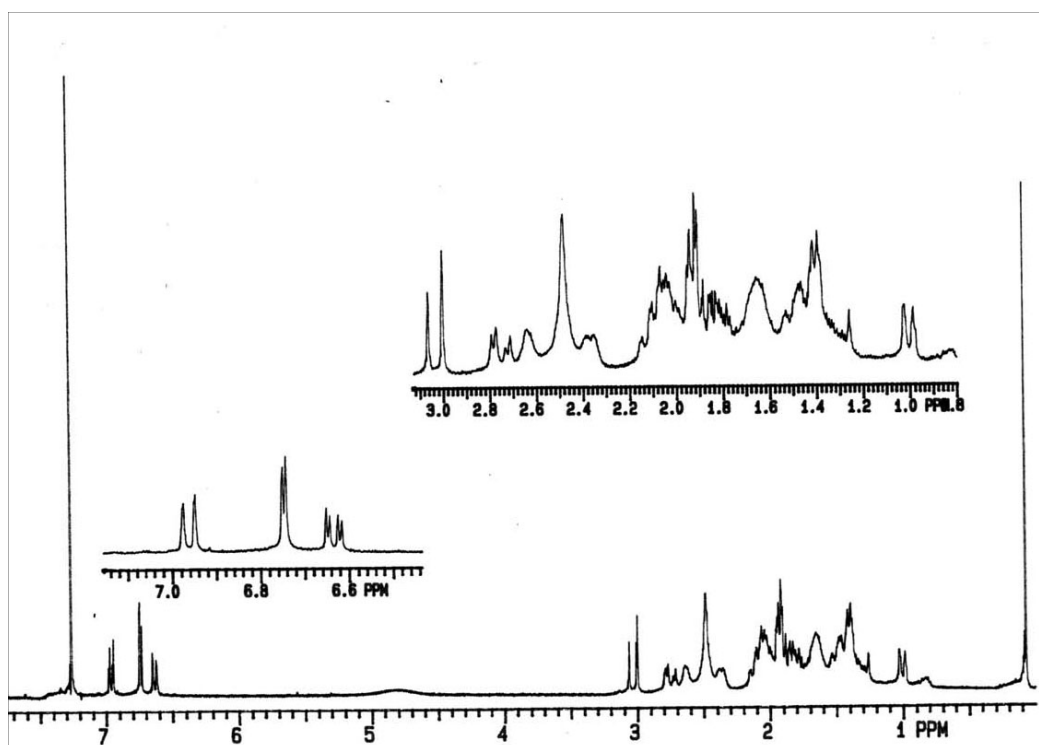


Figure 11 – NMR spectrum of Butorphanol in CDCl<sub>3</sub>



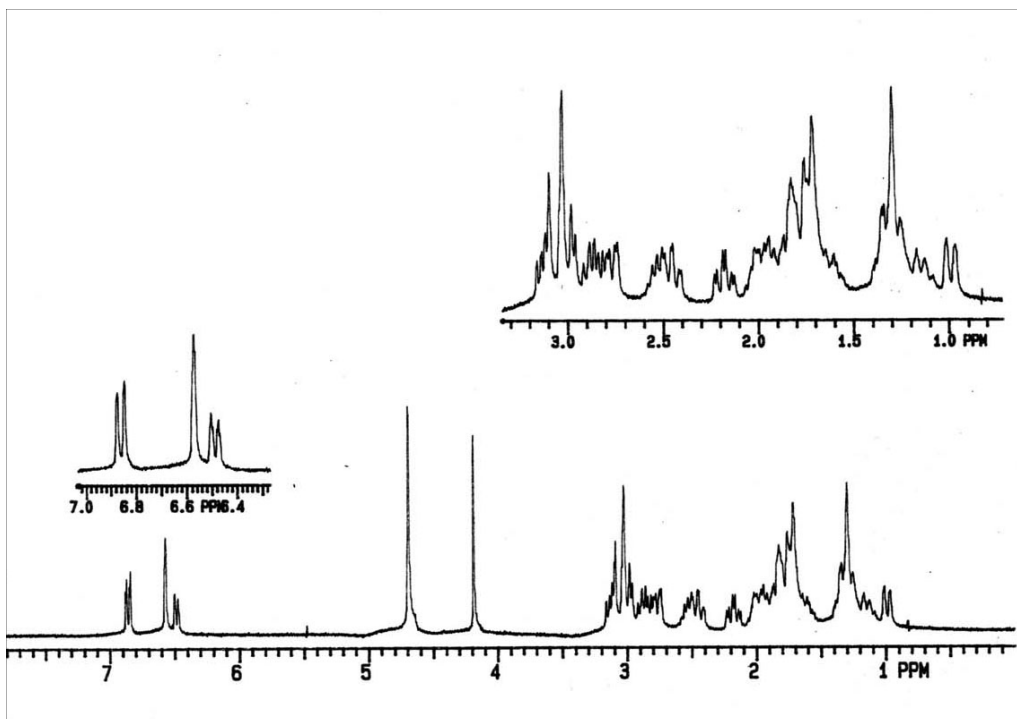


Figure 12 – NMR spectrum of Butorphanol Tartrate in CD<sub>3</sub>OD

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#### Acknowledgements

We would like to thank William M. Callan, Diversion Investigator, Drug Enforcement Administration, Timothy A. Williams, DVM, Animal Medical Center, Murfreesboro, TN, and Edwin C. Derks, DVM, Derks Animal Clinic, P.A, Miami, FL, for their valuable contributions.

## SELECTED REFERENCES

[Note: Selected references are a compilation of recent publications of presumed interest to forensic chemists. Unless otherwise stated, all listed citations are published in English. If available, the email address for the primary author is provided as the contact information. Listed mailing address information (which is sometimes cryptic) exactly duplicates that listed by the abstracting services.]

1. Taber DF, Neubert TD, Rheingold AL. **Synthesis of (-)-morphine**. Journal of the American Chemical Society 2002;124(42):12416. [Editor's Notes: No abstract was provided. Contact: DF Taber, Univ Delaware, Dept Chem & Biochem, Newark, DE 19716.]
2. Booth G, Johnston F, Jackson G. **Case assessment and interpretation - Application to a drugs supply case**. Science and Justice 2002;42(2):123. [Editor's Notes: Presents a model for establishing drug trafficking patterns, emphasizing precise use of language. Contact: Forensic Science Service, Chepstow Laboratory, Usk Road, Chepstow, Gwent NP6 6YE, United Kingdom.]
3. Su C-W, Babcock K, deFur P, Noble T, Rigdon S. **Columnless GC/IMS (II) - A novel on-line separation technique for ionscan analysis**. International Journal of Ion Mobility Spectrometry 2002;5(2):160. [Editor's Notes: Presents results indicating that placing an extra layer of filter paper either under or over a swipe sample during ionscan analysis improved drug detection results (this was attributed to a temperature ramping and chromatographic effect). Contact: U.S. Coast Guard Research and Development Center, Groton, CT 06340.]
4. Su C-W, Rigdon S, Babcock K, Noble T, deFur P. **Columnless GC/IMS (I) - A study of the variation in the thermal desorption profiles of three models of ionscan IMS instrument**. International Journal of Ion Mobility Spectrometry 2002;5(2):175. [Editor's Notes: Presents results indicating that placing an extra layers of filter paper under a sample induced a thermal delay effect (similar to GC temperature ramping), whereas placing an extra layers of filter paper over a sample induced a chromatographic effect (similar to a GC column) during ionscan analysis. Contact: U.S. Coast Guard Research and Development Center, Groton, CT 06340.]
5. Griffin LBS. **Trace level confirmation of controlled substances found by ion mobility spectrometry, with quadrupole ion-trap spectrometry**. International Journal of Ion Mobility Spectrometry 2002;5(3):31. [Editor's Notes: Presents a study that indicates the CI-MS/MS is well suited to confirming results obtained by IMS spectroscopy. The method has been used for methamphetamine and cocaine. Contact: No contact information was provided.]
6. Alizadeh N, Mehdipour R. **Drug-selective electrode for ketamine determination in pharmaceutical preparations and electrochemical study of drug with BSA**. Journal of Pharmaceutical and Biomedical Analysis 2002;30(3):725. [Editor's Notes: For for determination of ketamine hydrochloride in pharmaceutical preparations using direct potentiometry. A secondary study examining the binding between ketamine and bovine serum albumin (BSA) was also presented. Contact: Alizadeh N, Tarbiat Modarres Univ, Sch Sci, Fac Sci, Dept Chem, POB 14115-111, Tehran 14488, Iran.]
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exposure during storage and handling. Contact: Nudelman NS, Univ Buenos Aires, Fac Ciencias Exactas & Nat, Dept Quim Organ, Pab 2, P3 Ciudad Univ, RA-1428 Buenos Aires, DF, Argentina.]

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9. Yritia M, Riba J, Ortuno J, Ramirez A, Castillo A, Alfaro Y, delaTorre R, Barbanoj MJ. **Determination of N,N-dimethyltryptamine and beta-carboline alkaloids in human plasma following oral administration of Ayahuasca.** Journal of Chromatography B - Analytical Technologies in the Biomedical and Life Sciences 2002;779(2):271. [Editor's Notes: Presents an analytical methodology for the quantification of the four main alkaloids present in ayahuasca, plus two major metabolites in human plasma, using GC and HPLC with fluorescence detection. Contact: Barbanoj MJ, Univ Autonoma Barcelona, Area Invest Farmacol, Inst Recerca, Dept Farmacol & Terapeut, Hosp Santa Creu & Sant Pau, St Antoni Maria Claret 167, Barcelona 08025, Spain.]
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12. Gambelunghe C, Melai P. **Absinthe: Enjoying a new popularity [sic] among young people?** Forensic Science International 2002;130(2-3):183. [Editor's Notes: Includes chromatographic profiles of ethanolic extracts of *Artemisia absinthium* leaves, and the mass spectra of beta-thujone, the presumed active constituent. Contact: P. Melai at: [med\\_leg@unipg.it](mailto:med_leg@unipg.it)]

#### Additional References of Possible Interest:

1. Peng LJ, Wen ML, Yao Y. **Potentiometric determination of fentanyl in pharmaceutical formulations.** Journal of Pharmaceutical and Biomedical Analysis 2002;30(3):667. [Editor's Notes: For determination of fentanyl citrate in injectable solutions. Contact: Wen ML, Yunnan Univ, Dept Chem, Kunming 650091, Peoples R China.]

2. Chamberlain RT. **Dry transfer method for sample preparation and transfer of forensic test samples, especially for explosives and narcotics.** U.S. US 6,470,730 (C1. 73-1.03; G01N17/00), 29 Oct 2002, Appl. 640,660, 18 Aug 2000. [Editor's Notes: Presents a method for sample preparation for analysis that includes the use of a non-porous flexible polytetrafluoroethylene (PTFE) strip. Contact: No contact information was provided.]
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4. Gentili S, Torresi A, Marsili R, Chiarotti M, Macchia T. **Simultaneous detection of amphetamine-like drugs with headspace solid-phase microextraction and gas chromatography-mass spectrometry.** Journal of Chromatography B - Analytical Technologies in the Biomedical and Life Sciences 2002;780(1):183. [Editor's Notes: Presents a headspace-SPME-GC/MS procedure for the simultaneous detection of MDA, MDMA, MDEA, and MBDB in hair. Contact: Macchia T, Ist Super Sanita, Dept Clin Biochem, Drug Abuse Sect, Viale Regina Elena 299, I-00161 Rome, Italy.]
5. Liu RH, Lin D-L, Chang W-T, Liu C, Tsay W-I, Li J-H, Kuo T-L. **Isotopically labeled analogues for drug quantitation.** Analytical Chemistry 2002;74(23):619A.. [Editor's Notes: Presents an overview and review of the topic, with an emphasis on analysis of biological matrices. Contact: [rayliu@uab.edu](mailto:rayliu@uab.edu)]
6. Ang CYW, Cui Y, Chang HC, Luo W, Heinze TM, Lin LJ, Mattia A. **Determination of St. John's Wort components in dietary supplements and functional foods by liquid chromatography.** Journal of the AOAC International 2002;85(6):1360. [Editor's Notes: Presents a rapid extraction technique and reversed-phase LC/UV analysis to determine the 4 characteristic biactive compounds in St. Hohn's Wort in dietary supplements and various foodstuffs. Contact: [cang@nctr.fda.gov](mailto:cang@nctr.fda.gov)]

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## SCIENTIFIC MEETINGS

1. **Title: 50th Anniversary Meeting of the Canadian Society of Forensic Science (CSFS)** (Third and Final Posting)  
**Sponsoring Organization:** Canadian Society of Forensic Science  
**Inclusive Dates:** March 24 - 29, 2003  
**Location:** Vancouver, British Colombia, Canada (Sheraton Wall Centre)  
**Meeting Registration Procedure, Deadline, and Costs:** [See website]  
**Recommended Lodging (Registration Deadline and Costs):** [See website]  
**Contact Individual's Name, Phone Number, and email Address:** [None Listed; CSFS General Number is: 613 738-0001; CSFS General email Address is: [csfs@sympatico.ca](mailto:csfs@sympatico.ca)]  
**Website:** [www.csfs.ca](http://www.csfs.ca)

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## THE DEA FY - 2003 STATE AND LOCAL FORENSIC CHEMISTS SEMINAR SCHEDULE

The remainder of the FY - 2003 schedule for the DEA's State and Local Forensic Chemists Seminar is as follows:

March 10 – 14, 2003

June 9 – 13, 2003

September 15 – 19, 2003

Note that the school is open only to forensic chemists working for law enforcement agencies, and is intended for chemists who have completed their agency's internal training program and have also been working on the bench for at least one year. There is no tuition charge for this course. For additional information, eligibility requirements, or to enroll, see the September 2002 issue of *Microgram Bulletin*, or call 703 668-3337.

\* \* \* \* \*

## THE JOURNAL/TEXTBOOK COLLECTION EXCHANGE *FREE TO ANY SUBSCRIBER*

The following, partial collections of the journals *Forensic Science International*, *Journal of Analytical Chemistry*, *Journal of Chemical Information and Computer Sciences*, and *Journal of Toxicology - Clinical Toxicology* are offered free of charge to any subscriber who wants them, on an all-or-nothing basis for each journal (i.e., no "cherry picking" of single issues). Forensic Science Libraries will be given preference. If interested, please contact the Editor at: [microgram\\_editor@mailsnare.net](mailto:microgram_editor@mailsnare.net) [Note: Postage will be covered by the DEA Office of Forensic Sciences.]

*Forensic Science International* - 1997 - 2000 (various issues missing from each year).

*Journal of Analytical Chemistry* - 1999 and 2001 (various issues missing from both years).

*Journal of Chemical Information and Computer Sciences* - 1995 - 1999 (missing 1995(6) and 1998(5)).

*Journal of Toxicology - Clinical Toxicology* - 1995 and 1996 (both years complete).

If there are no responses, these collections will be discarded one month after the hard copy of the January 2003 issue (this issue!) is mailed; therefore, interested subscribers should contact the Editor as soon as possible.

Note that the next offering of journals and textbooks will be in the April 2003 issue of *Microgram Bulletin*. Subscribers who are interested in donating items or collections should consult the Information and Instructions section on pages 25 - 29 of this issue.

\* \* \* \* \*

# Computer Corner

## Digital Evidence Collection Strategies

# #166

by Michael J. Phelan  
DEA Special Testing  
and Research Laboratory

An essential element in every digital evidence examination is the creation of an exact duplicate of the original evidence. This “working copy” is always preferred because it eliminates any possibility that either the original evidence or the associated date/time stamp file information could be changed during the examination processes.

Advances in computer forensic technology give today’s examiners a variety of software and hardware tools for creating duplicate copies. However, selection of the proper tool can be a complex decision, and may require compromises between the desired depth of analysis and time constraints, amount of data, and investigative scope.

### Situation Assessment

When a computer forensic examiner receives a case that will require a significant amount of data acquisition, one of the first and most important steps is determining the overall scope of the investigation. For example, is a specific database (corporate sales, purchasing, shipping files, etc.) needed? Are network audit logs, e-mail archives, or other files needed? Are the required data files just a small fraction of a large search domain? Will the search be limited to just a few computers (i.e., gigabytes of data) or rather many dozens or

hundreds of computers (i.e., terabytes of data)?

The answer to these questions drives the initial search. Small search domains (a few computers) can err on the side of caution and copy all of the potential digital evidence. However, large search domains (many computers) necessarily must restrict the data collection to either a workable number of computers or a reasonable number of files or databases. Failure to limit the scope in the latter such cases will result in an enormous amount of data that could easily take many months or even years to analyze.

### Intake Reduction

Data reduction at the time of collection can follow one of several strategies. The actual number of computers seized or duplicated on-site can be minimized by a discussion between the examiner and the investigator(s). Knowledge of the alleged crime and the nature of the business are also valuable intelligence that can be used to limit the scope of seizure. For example, a medical fraud case may need to focus only on one doctor and cover only a limited period of time. Similarly, in a large business, only the computer belonging to the subject of the investigation, one or two server(s), the computers(s) with Internet

connections, and/or the computer on the loading dock used for shipping, etc., may need to be examined. Limiting the number of seized computers means that the examination can likely be conducted in matter of weeks as opposed to several months, with little or no loss of material of investigative value.

### Data Reduction

Similarly, even greater efficiencies can be achieved by focusing on the collection of just a few specific files, databases, or data storage folders. This approach requires advanced knowledge of how the computer system operates, where the pertinent data is stored, and what types of data are needed for the investigation. This strategy is most frequently successful when administrative inspection warrants are used to collect very narrow categories of information such as Medicare records, pharmacy prescription records, etc. Other scenarios may include specific accounting records, an individual’s e-mail, or a document folder (such as /My Documents) containing employee, patient, or client correspondence.

### Hard Drive Copy Tools

There are several good choices of hard drive duplication tools available today. The selection of a duplication tool is usually based upon factors such as prior

examiner training or familiarity, cost, or ease of integration of the duplication tool into the follow-on examination software. For example, only Encase examination software will make a duplicate hard drive copy from an Encase image.

### **Encase or Ilook**

Graphical User Interface (GUI) based Computer Forensic platforms, such as Guidance Software's Encase or the British Ilook software, come with relatively fast hard drive duplication utilities. These functions enable exact one-to-one copying and bit-stream imaging capabilities (enabling large data blocks to be mounted as a virtual drive that contain all of the data and format structure contained in the original evidence). These tools operate from a Windows operating system environment, with a hard drive write-blocking protection used to prevent the original evidence from being changed during the normal hard drive boot up and access processes.

### **Ghost**

"Ghost" is a commercial hard drive software duplication utility that is included in Symantec's System Works suite. Ghost has a wide range of support levels, because it performs a number of different information technology functions, including file and hard drive backup. Note that it is important to always use the "forensic" software switches in order for Ghost to produce a complete, sector-by-sector copy.

### **Safeback**

A widely used DOS-based Computer Forensic tool is New

Technologies, Inc.'s "Safeback". This utility can both duplicate hard drives and produce a bit stream image file. Safeback files can also be processed by the Encase or Ilook examination platforms. However, Safeback only operates using DOS, and this greatly reduces its copying speed versus GUI-based tools.

### **Unix "dd" and SMART**

Another effective choice can include use of the Unix "dd" copy command. This choice requires moving the examination platform, at least for the hard drive data copying process, to a Unix-based computer running Linux Red Hat or some other variant. Unix is able to write-block a hard drive through standard line commands (a unique feature). However, a potential problem with the Unix-based acquisition approach involves the complexity of the command line syntax. This requires examiners to receive specialized training or on-the-job skill development.

Recently, ASR Data Systems released their SMART software, which uses a GUI-based "click-and-drag" interface to simplify hard drive duplication and imaging processes.

### **Hard Drive Duplicators**

Hard drive duplicators are hardware-based solutions to the data duplication process. Some of the latest devices are forensically enabled, and will copy all sectors on a hard drive to a second hard drive. The devices themselves are small and can fit into a small carry case or standard briefcase. Integrated Computer Solution's Image

Maaster Solo2 and Logicube's SF-5000 are two products that are specifically designed for on-site hard drive duplication. Similar hard drive duplicators exist, but are commercially used to deploy clones of network clients or specialized computer terminals. However, some of these systems only copy active files, limiting their utility if a complete forensic examination is required.

### **Conclusions**

The increasing volume of potential data to search is creating a nationwide problem for law enforcement. Seizing all the computers at a search site, and examining them at the deepest levels, are the most significant factors contributing to the examination backlog. In order to alleviate this problem, new data intake and data reduction strategies must be implemented. Data acquisition strategies must be adapted to the case-specific investigative goals, and these strategies must be pragmatic with regards to data volume and time constraints. Failure to recognize that yesterday's computer is not the equivalent of today's computer - and is not even remotely similar to tomorrow's computer - will inevitably result in lost investigative leads, and ineffective prosecutions.

Questions or comments?  
e-mail: [mphelan@erols.com](mailto:mphelan@erols.com)



## Information and Instructions for *Microgram Bulletin*

[Editor's Preface: The following information and instructions are derived from the *Microgram* website < <http://www.dea.gov/programs/forensicsci/microgram/index.html> >, and are provided here for the convenience of those subscribers who do not have access to the Internet. This material will henceforth be published only in the respective January issues for each year.]

### **General Information**

*Microgram Bulletin* is a monthly newsletter published by the U.S. Drug Enforcement Administration's Office of Forensic Sciences, and is primarily intended to assist and serve forensic scientists concerned with the detection and analyses of suspected controlled substances for forensic/law enforcement purposes.

### **Subscriptions to Microgram Bulletin**

*Microgram Bulletin* is unclassified (as of the January 2003 issues), and is published on the DEA public access website (see the above URL). **Private citizens should use the website to access *Microgram Bulletin*.** Professional scientific and law enforcement personnel may either use the website or request a subscription. Subscriptions are available electronically and in hard copy. Electronic subscriptions require Internet access. The publications themselves will not be sent electronically to any subscriber; rather, an email notification of the pertinent URL will be sent to the subscriber when the respective issue is posted on the website. Requests for hard copies are strongly discouraged, and should be limited to those offices that do not have access to the Internet, require hard copies for their libraries, or have some other valid reason (Note: "For my personal collection" is not considered to be a valid reason). Requests for hard copies should indicate the number of copies required (maximum of two allowed per office), and should also include formal justification. Note that due to publication delays beyond the control of the Office of Forensic Sciences, hard copies will arrive from 30 to 90 days after electronic posting.

Requests to be added to the subscription list should be submitted via email to the *Microgram* Editor at: [microgram\\_editor@mailsnare.net](mailto:microgram_editor@mailsnare.net) [NOTE: NEW email address!] If email submission is not possible, requests should be mailed to: *Microgram* Editor, Drug Enforcement Administration, Office of Forensic Sciences, 2401 Jefferson Davis Highway, Alexandria, VA 22301. All requests to be added to the *Microgram* mailing list should include the following **Standard Contact Information**:

- \* The Full Name and Mailing Address of Submitting Laboratory or Office;
- \* The Full Name, Title (Laboratory Director, Assistant Special Agent in Charge, Librarian, etc.), Phone Number, FAX Number, and Preferred email Address of the Submitting Individual (Note that subscriptions are mailed to titles, not names, in order to avoid subscription problems arising from future personnel changes);
- \* If available, the generic email address for the Submitting Laboratory or Office;
- \* If a generic email address is not available, **one** private email address for an individual who is likely to be a long-term employee, who has a stable email address, and who will be responsible for forwarding *Microgram* information to all of the other employees in the requestor's Office (Note that only one email address per Office will be honored);
- \* If requesting hard copy mailings, the number of copies requested (two max), and justification.



Requests to be removed from the *Microgram* subscription list, or to change an existing subscription, should also be sent to the *Microgram* Editor. Such requests should include all of the pertinent standard contact information detailed above, and also should provide the email and/or hard mail address currently being utilized for the requestor's subscription.

Note that, due to mailing delays and/or publication timeframes, subscription requests/changes may take as long as 90 days to implement.

### **Costs**

Subscriptions to *Microgram* are free.

### **Submissions to *Microgram Bulletin***

*Microgram Bulletin* includes Intelligence Alerts, Safety Alerts, Intelligence Briefs, Selected Intelligence Briefs, Selected Literature References, Meeting Announcements, Employment Opportunities, pertinent sections from the Code of Federal Regulations (CFR-21), Columns of topical importance, and similar material of interest to the counter-drug community. Explanatory details for most of the above types of submission are detailed below, and typical examples are provided in most issues of *Microgram Bulletin*.

All submissions must be in English. Because *Microgram Bulletin* is unclassified, **case sensitive information should not be submitted!** All submissions should, whenever possible, be submitted electronically, as straight email or as an IBM® PC-compatible Corel WordPerfect® or Microsoft Word® attachment, to: [microgram\\_editor@mailsnare.net](mailto:microgram_editor@mailsnare.net) [NOTE: NEW email address!] Current versions of Corel WordPerfect® or Microsoft Word® (defined as having release dates less than 5 years old) should be utilized. If email submission is not possible, submissions may be mailed to: *Microgram* Editor, Drug Enforcement Administration, Office of Forensic Sciences, 2401 Jefferson Davis Highway, Alexandria, VA 22301. Hard copy mailings should be accompanied by an electronic version on a 3 ½ inch IBM® PC-compatible diskette. **Note that diskettes should be mailed in an irradiation-proof protective sleeve, and the mailing envelope should be marked: "Warning - Contains Electronic Media - Do Not Irradiate"**. Note also that mailed submissions may be subject to lengthy handling delays beyond the control of the Office of Forensic Sciences, and electronic media sent through the mail may be destroyed en route by sanitizing procedures, despite protective measures and written warnings. All submissions should include the following **Contact Information**: The Full Name and Address of Submitting Laboratory or Office, and the Full Name, Phone Number, FAX Number, and Preferred email Address of the Submitting Individual.

**Intelligence Briefs** are concise synopses of the physical and chemical characteristics of novel and/or interesting exhibits submitted to law enforcement laboratories involved in the detection and analyses of suspected controlled substances for forensic/law enforcement purposes. They should include descriptive details adhering to (as appropriate) the following outline:

What laboratory did the analysis?

Where is the laboratory located?

What agency seized the exhibit?

Where was the exhibit seized?

Were there any special circumstances of the seizure (unusual smuggling technique, etc.)

What controlled substance was suspected upon submission?

Detailed physical description (appearance, dimensions, logos, odor, packaging, etc.)

Quantities (numbers of tablets, packages or bricks, average mass, net mass, etc.)

Photos (jpeg images preferred)  
What techniques were used to analyze the exhibit?  
Actual identity of the exhibit?  
Quantitation data? (if approximate, so state)  
Adulterants and diluents? (if identified)  
First seizure of this type? (if not, provide brief details of previous examples)  
Editorial comments? (if any)  
Literature references? (If any)

In order to avoid confusion, if uncommon controlled substances are identified (e.g., “2C-T-7”, “Nexus”, or “STP”), the description should include the full name(s) of the identified substances (acronyms or street names can be included in parentheses after the full name). Photographs of subject exhibit(s) should include either a metric ruled scale or a coin or bill (U.S. currency) to place the exhibit’s size in context.

**Intelligence Alerts and Safety Alerts** are urgent communiques to the *Microgram Bulletin* readership which give notice of a specific forensic/drug-related enforcement and/or safety issue. In addition to the descriptive details listed under “Intelligence Briefs” above, they should include a concise synopsis of the issue, recommendations (if any), pertinent literature citations (if any are known), and a mechanism for providing feedback (if appropriate).

**Selected Intelligence Briefs** are reprinted (with permission) unclassified intelligence briefs of presumed interest to the *Microgram Bulletin* readership that have been previously published in restricted or non-restricted publications or websites that are also dedicated to the detection and analyses of suspected controlled substances for forensic/law enforcement purposes. Selected Intelligence Briefs must be unclassified, and should be a minimum of 1 page and a maximum of 10 pages in length (single spaced at 11 pitch Times New Roman font, including photos, tables, charts, etc.) All *Microgram Bulletin* subscribers are invited to submit such material, which must include the author’s and publisher’s contact information.

**Selected Literature References** is a monthly compilation of reference citations of presumed interest to the *Microgram Bulletin* readership, derived from approximately 2500 scientific periodicals. The focus of the Selected Literature References is the detection and analysis of suspected controlled substances for forensic/law enforcement purposes. References from clinical and toxicological journals are included only if the material is considered to be of high interest to forensic chemists. Note that citations from obscure periodicals may be missed, and all *Microgram Bulletin* subscribers are invited to submit citations of interest if they do not appear in *Microgram Bulletin* within three months of their publication. Citations should include a summary sentence and the primary author’s email or mailing address.

**Meeting Announcements** is a monthly compilation of upcoming meetings of presumed interest to the *Microgram Bulletin* readership. **In general, only meetings which are dedicated to forensic chemistry/forensic drug analysis or include a subsection so dedicated will be publicized in *Microgram Bulletin*.** Meeting Announcements should include the Formal Title, Sponsoring Organization, Inclusive Dates, Location (City, State, and specific locale), Meeting Registration Costs and Deadline, Recommended Hotel Registration Costs and Deadline (include details on special rates where available), and Contact Individual’s Name, Phone Number, and email Address. If available, the URL for the meeting website should also be included in the Announcement. Meeting Announcements will be posted for a maximum of three consecutive months, but not past the registration deadline.

**Employment Opportunities** is a monthly compilation of job announcements of presumed interest to the *Microgram Bulletin* readership. **In general, only jobs with a forensic chemistry/forensic drug analysis**

**focus for Federal, State, or Local Crime Laboratories or Offices will be publicized in *Microgram Bulletin*.** Exceptions may be requested and will be considered on a case-by-case basis. Employment Opportunity announcements should include the Formal Title of the Organization, Formal Title of the Laboratory or Office, Position Title, Laboratory or Office Location (City and State), Salary Range, Opening and Closing Dates, Duties, General Requirements, Specialized Requirements (if any), Application Procedures, and the Contact Individual's Name, Phone Number, email Address, and Mailing Address. If available, the URL for the agency's website, and (if available) the specific URL for the job posting should also be included in the Announcement. Employment Opportunities will be posted for a maximum of 3 consecutive months, but not past the application deadline.

#### **The Journal/Textbook Collection Exchange**

If any subscriber is interested in donating any forensic or analytical chemistry journal and/or textbook collection to a fellow subscriber or library, *Microgram Bulletin* is willing to list the offered materials and the associated contact information in a future issue (currently January, April, July, and October). The general format should follow the example in this issue, and should be sent via email to the *Microgram* Editor at: [microgram\\_editor@mailsnare.net](mailto:microgram_editor@mailsnare.net) [NOTE: NEW email address!] Only items for donation (not for sale) will be considered for publication, and donations to libraries should adhere to journal restrictions and/or time limits (if any) on such offers.

#### **Requests for *Microgram* and/or *Microgram Bulletin* Archives, 1967 - 2002**

All issues of *Microgram* (November 1967 - March 2002) and the first nine issues of its successor *Microgram Bulletin* (April - December, 2002) were **Law Enforcement Restricted** publications, and are therefore (permanently) unavailable to the general public. [Note that this restriction includes requests made under the Freedom of Information (FOI) Act.]

Past issues or individual sections of issues (e.g., specific articles) are available to law enforcement affiliated offices and laboratories. Requests from such offices and laboratories **must be made on official letterhead** and mailed to:

Deputy Assistant Administrator  
Office of Forensic Sciences  
Drug Enforcement Administration  
2401 Jefferson Davis Highway  
Alexandria, VA 22301

Note that requests made via email will not be honored.

### **DISCLAIMERS**

1) All material published in either *Microgram Bulletin* is reviewed prior to publication. However, **the reliability and accuracy of all published information are the responsibility of the respective contributors, and publication in *Microgram Bulletin* implies no endorsement by the United States Department of Justice or the Drug Enforcement Administration.**

2) Due to the ease of scanning, copying, electronic manipulation, and/or reprinting, **only the posted copies of *Microgram Bulletin* (on [www.dea.gov](http://www.dea.gov)) are absolutely valid.** All other copies, whether

electronic or hard, are necessarily suspect unless verified against the posted versions.

3) **WARNING!:** Due to the often lengthy time delays between the actual dates of seizures and their subsequent reporting in *Microgram Bulletin*, and also because of the often wide variety of seizure types with superficially similar physical attributes, published material cannot be utilized to visually identify controlled substances currently circulating in clandestine markets. **The United States Department of Justice and the Drug Enforcement Administration assume no liability for the use or misuse of the information published in *Microgram Bulletin*.**

# Microgram

## *Bulletin*

**Published by:**

**The Drug Enforcement Administration  
Office of Forensic Sciences  
Washington, DC 20537**

**The U.S. Attorney General has determined that the publication of this periodical is necessary in the transaction of the public business required by the Department of Justice. Information, instructions, and disclaimers are published in the January issues.**

**VOL. XXXVI, NO. 2**

**FEBRUARY 2003**

**- INTELLIGENCE ALERT -**

**COCAINE BRICKS SEALED IN A POLYMERIC COATING IN EL PASO, TEXAS**

The DEA South Central Laboratory (Dallas, Texas) recently received a submission of three unusually packaged bricks, suspected cocaine. The bricks were seized in El Paso, Texas by the U.S. Customs Service. In addition to the usual layers of plastic wrapping and tape, each brick was sealed in multiple coatings of an unknown, translucent polymer (see Photo 1). The polymeric material was fairly difficult to remove from the bricks. Analysis indicated that it was probably an ethylene/vinyl acetate copolymer. Analysis of the compressed brick powder (combined net mass 2,943 grams) confirmed 84



**Photo 1**

percent cocaine hydrochloride. This is the second encounter with polymer coated cocaine bricks by the South Central Laboratory.

[Editor's Notes: According to the analyst, this concealment technique is not commonly seen. The defendants in this case indicated that the bricks were dipped into the polymeric material to make them waterproof. The packaged bricks would then be dropped at pre-arranged locations in the Gulf of Mexico or in the bayous of Louisiana, for later retrieval. The total net mass of each brick (that is, 1 kilogram of cocaine and all the packaging) was about 1.5 kilograms. Somewhat surprisingly, the polymeric coating did *not* have a particularly noticeable odor.]

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### **- INTELLIGENCE ALERT -**

#### **COCAINE DISSOLVED IN CANNED LIQUIDS AT JFK AIRPORT, NEW YORK**

The DEA Northeast Laboratory (New York, New York) recently received a submission of 10 metal cans, suspected of containing cocaine dissolved in various liquid food matrices. The cans were seized by the U.S. Customs Service at John F. Kennedy Airport from the luggage of a passenger arriving on a flight from Guyana. The cans had labels indicating they contained 400 milliliters each of "Sococo - Coconut Cream" or "Coconut Milk", and contained products which varied from a dark amber liquid to a cream colored paste (see Photo 2). Of note, the labels on some of the cans were slightly misaligned. The combined net mass of the contents in the ten cans was 6,159 grams. Analysis by crystal testing, GC/MS, GC/FID, and GC/IRD confirmed 39 percent cocaine (salt form undetermined). Caffeine, phenacetin, and dimethylterephthalate were also identified. The Northeast Laboratory has received several similar submissions of canned liquids containing cocaine in the past.



**Photo 2**

\* \* \* \* \*

### **- INTELLIGENCE ALERT -**

#### **BLACK TAR HEROIN CONCEALED BEHIND POSTAGE STAMPS IN CORCORAN, CALIFORNIA**

The DEA Western Laboratory (San Francisco, California) recently received a case from the California Substance Abuse Treatment Facility and State Prison at Corcoran, consisting of four letters with suspected heroin behind the stamps. The letters had been mailed to an inmate, and



had been seized by prison authorities. The sender had secured about 200 mg of black tar heroin to the back of each stamp with a piece of clear plastic, then stuck the stamps on the envelopes (see Photo 3). The recovered material had a total net mass of 0.81 grams. Analysis by GC/FID and GC/MS confirmed 67 percent heroin. This was the first submission of this type to the Western Laboratory.

[Editor's Notes: Similar exhibits of heroin concealed behind postage stamps were reported in the August 1997 issue of *Microgram* and the November 2002 issue of *Microgram Bulletin*. Both of these previously reported cases also involved either postcards or letters sent to incarcerated prisoners.]



**Photo 3**

\* \* \* \* \*

### **PHENCYCLIDINE BASE IN GRAND JUNCTION, COLORADO**

The Grand Junction Police Department Laboratory recently received two Gatorade gallon jugs containing an orange liquid, suspected phencyclidine (PCP) (see Photo 4). The jugs were located in a black cloth suitcase seized by the Grand Valley Joint Drug Task Force at the Grand Junction Greyhound bus station. The two suspects involved were travelling from Compton, California to Cincinnati, Ohio. Passive evaporation of the liquids (in a exhaust hood) reduced their volume by about two thirds (see Photo 5). Analysis of the final solution by GC/MS confirmed fairly clean phencyclidine base. The easily evaporated solvent was petroleum ether. The laboratory has previously received phencyclidine base samples seized at the bus station (two occasions), but not in these quantities.



**Photo 4**



**Photo 5**

## Selected Intelligence Brief

### Cocaine Signature Program Report (January 2003)

**U.S. Drug Enforcement Administration  
Special Testing and Research Laboratory  
22624 Dulles Summit Court  
Dulles, VA 20166**

[Unclassified; Reprinted With Permission]

#### INTRODUCTION

Beginning in 1997, the DEA's Special Testing and Research Laboratory (SFL-1) began an in-house Cocaine Signature Program (CSP) to identify trends in cocaine processing. In this program, samples of cocaine hydrochloride obtained from major seizures within the United States are examined. Each year, through the CSP, in-depth chemical analyses are performed on over 2000 cocaine HCl exhibits obtained from bulk seizures throughout the United States. The program also examines cocaine exhibits seized throughout the world. Additionally, samples of solvents, reagents, and other materials seized from South American illicit cocaine laboratories are examined. Analytical methodologies developed at SFL-1 give evidence of how and where coca leaf was processed to cocaine base (geographical origin), and how and where cocaine base was converted to cocaine hydrochloride (processing origin). Correlated data from all these seizures are reported on a quarterly basis.

During the fourth quarter of 2002, 946 cocaine and cocaine related exhibits were examined by the CSP. Of these exhibits, 930 were from throughout the U.S. and 16 were from either Colombia, Korea, Ecuador, Brazil, Thailand, or Mexico.

#### 4th QUARTER OF CY 2002 CSP RESULTS

##### Origin of Cocaine – Where the Coca Leaf Originated

Scientists at SFL-1 have developed state-of-the-art methods that can determine the geographic

origin (country) of the coca leaf used to produce a cocaine exhibit with a confidence level exceeding 95%. There are several coca-growing regions within South America. Due to recent major coca expansion, all Colombian coca-growing regions are now collectively reported as "Colombia". The major growing regions within Peru and Bolivia are reported as such. A map of these regions is presented below.

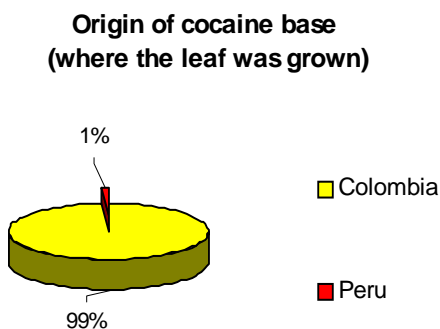


Determination of the geographical and processing origins of illicit cocaine exhibits provides valuable information to the counter-drug intelligence



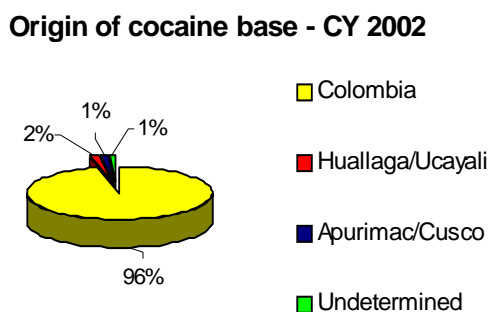
community and U.S. policymakers. Intelligence information derived from this program enables the law enforcement community to determine cocaine distribution and trafficking routes throughout the world, and determine where cocaine base is specifically produced in the Andean Ridge.

For this reporting period, 930 exhibits seized throughout the U.S. were subjected to origin analysis. Results are presented in the chart below.



Ninety-nine percent of the exhibits originated from Colombian coca, while 1% originated from the Huallaga/Ucayali and Apurimac/Cusco Valleys of Peru. Exhibits of very poor quality were not subjected to origin analysis. Solvent profiles conducted on exhibits revealed that all of the Peruvian cocaine exhibits were actually converted to cocaine HCl by Colombian processing methods (probably outside of Peru). Three exhibits (not shown) were converted to cocaine HCl by the Bolivian Method.

For CY 2002, over 2,650 cocaine HCl exhibits from seizures within the United States were

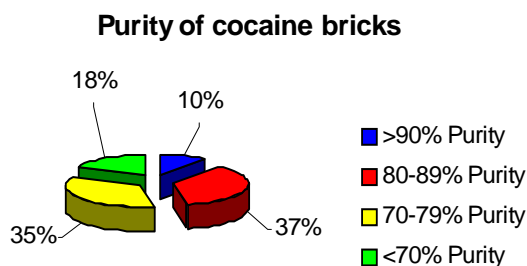


examined for cocaine base origin. The results are illustrated in the above chart.

**Ninety-six percent of the exhibits (N=2553) were produced from Colombian coca leaf.** The Huallaga/Ucayali and Apurimac/Cusco Valleys of Peru accounted for 1.8% (N=49) and 1.1% (N=29), respectively. Only one exhibit was found to be from Bolivian coca leaf. Coca leaf origin could not be determined for 1% (N=25) of the exhibits.

### Purity of Seized Kilograms

Generally, uncut exhibits (usually 1 kilogram bricks) have a purity of 80-90+%. Uncut means that nothing has been added to dilute the cocaine. Data pertaining to cocaine brick purity is shown in the chart below. There has been a continuous

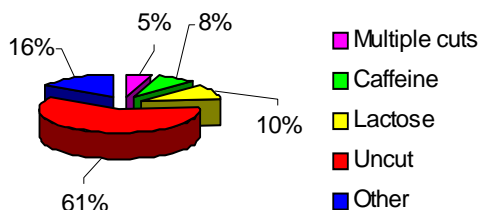


decrease in cocaine brick purity over the past four years and now appears to be leveling off at an average purity of 77%. The majority of the exhibits examined during the fourth quarter of CY 2002 had cocaine purities less than 80%. Those exhibits were usually cut with a diluent.

A significant decrease in the number of cut bricks has occurred during the last two reporting periods (36% and 39%). Data pertaining to cut versus uncut bricks for this reporting period is shown on the next page.

During this reporting period, lactose was the most prevalently used cutting agent, followed by caffeine. A significant number (16%) of exhibits contained other cutting agents, including procaine, mannitol, baking soda, lidocaine, inositol, boric acid, dimethyl terephthlate, phenacetin, and/or salt.

### Uncut and cut cocaine bricks

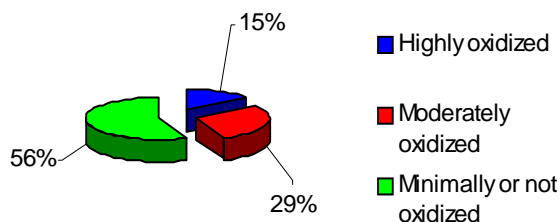


### Production of Cocaine Base from Coca

When cocaine is extracted from coca leaf, the crude product is usually refined to remove two major impurities (*cis*- and *trans*- cinnamoyl-cocaine) and coloration. This purification is accomplished by adding potassium permanganate or a substitute oxidizing agent to an acidic solution of the crude cocaine. This step is referred to as oxidation, since potassium permanganate oxidizes the two major impurities and colored impurities.

The CSP monitors the presence and relative abundance of the two above referenced impurities to determine the extent of oxidation. The relative use of an oxidizing reagent is directly related to its availability and cost on the black market. During this reporting period, approximately 15% of the exhibits were highly oxidized (or reoxidized), 29% of the exhibits had undergone only moderate oxidation, and 56% were minimally or not oxidized. The extent of oxidation is consistent with the last reporting period. Data depicting the extent of oxidation is presented below.

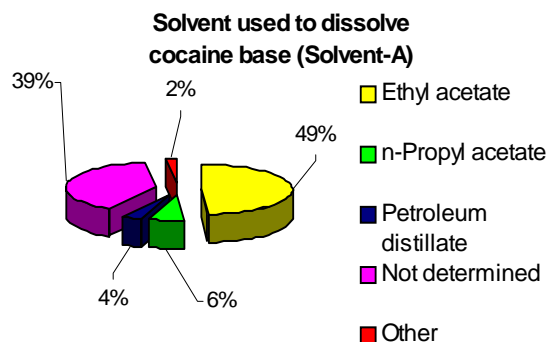
### Use of oxidizers for purification



### Conversion of Cocaine Base to Cocaine HCl

Cocaine base is converted to cocaine HCl by the same general procedure throughout South America. In summary, one kilogram of cocaine base is dissolved into approximately 10 liters of a solvent (solvent-A.) Separately, approximately 10 liters of a second solvent (solvent-B) is mixed with a sufficient quantity of either concentrated hydrochloric acid (HCl) or alcoholic HCl. The solvent-B mixture is then added to solvent-A (containing the dissolved cocaine base.) Cocaine HCl immediately crystallizes from the combined solutions. The solid product is then filtered, pressed into bricks, microwaved until dry, and wrapped in appropriate materials for shipping.

Data specifying various types of Solvent-A's are presented in the chart below. For this reporting

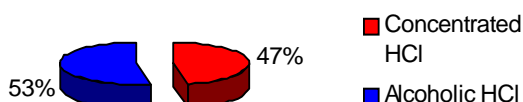


period, the CSP determined that the most prominent solvents (solvent-A) utilized for dissolving the cocaine base were ethyl acetate and n-propyl acetate. The identity of Solvent-A could not be determined for approximately 39% of the exhibits because of the complexity of the solvent profile. However, it should be noted that many of those exhibits listed as "not determined" (94 of 363) contained a mixture of xylenes, isobutyl acetate, and n-propyl acetate. **The data continues to indicate that a major cocaine processing change has occurred in Colombia. This new solvent combination appears to be consistent with a commercial solvent mixture used/sold as a "thinner" for the coatings/paint industry.** The CSP has been unable to acquire the suspected thinner (Dissolvente 1a) to authenticate

its use. **If the use of this new commercial mixture can be verified, it represents a significant share in cocaine processing.**

In order to convert cocaine base to cocaine HCl, a source of HCl is required. Either concentrated HCl or an alcoholic solution of hydrogen chloride gas (alcoholic HCl) is typically used. The latter solution is referred to as “yogurt,” “concentrado,” or “etachlor.” Alcohols that are typically used are methanol, ethanol, 1-propanol, and 2-propanol. Data obtained by the CSP for the source of HCl are shown below.

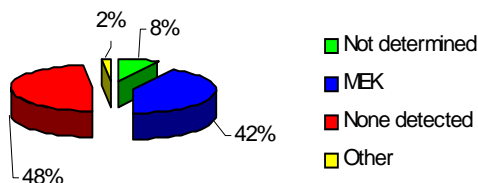
**Source of HCl**



The use of alcoholic HCl first appeared in 1998 and has been gradually replacing concentrated hydrochloric acid in many illicit laboratories. It is possible that the use of alcoholic HCl makes the recycling of waste solvents easier.

For this reporting period, the CSP determined that the most prominent solvent utilized for dissolving the HCl (solvent-B) was methyl ethyl ketone (MEK). Solvent-B could not be determined for approximately 9% of the exhibits due to the complexity of the solvent profile. For many of the exhibits (38%), no solvent-B was detected. In these instances, it appears that alcoholic HCl was

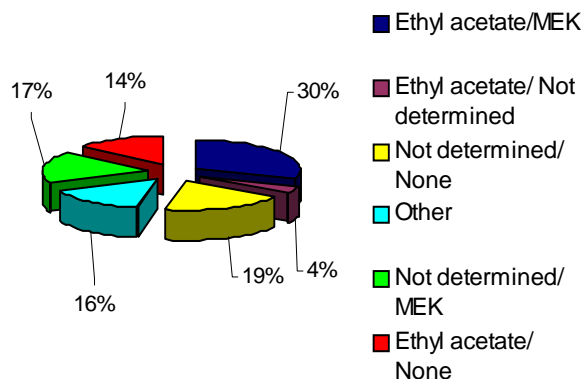
**Solvent used to dissolve HCl (Solvent-B)**



added directly to the solvent-A/cocaine base mixture. Data specifying the various types of Solvent-B's are presented in the above chart. The results are similar to those reported last quarter.

The most commonly encountered solvent-A + solvent-B combinations were ethyl acetate/MEK (30%) and ethyl acetate/no solvent-B (14%). **These values do not take into account the possible use of a new commercial solvent mixture as discussed earlier.** The relative use of solvent combinations is presented in the chart below.

**Solvent combinations**



Operators in Colombia are currently known to use ethyl acetate and/or n-propyl acetate for solvent-A and MEK or nothing for solvent-B. Operators in Peru use acetone for both solvent-A and solvent-B (acetone only method). Processors in Bolivia generally use ether for solvent-A and acetone for solvent-B. Three of the above exhibits were produced by the Bolivian Method.

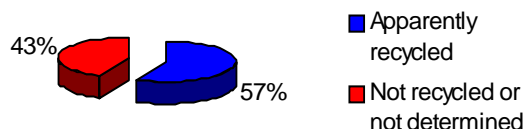
Distinguishing the processing origin of cocaine HCl is a relatively easy task based on the solvent profile of a seized cocaine HCl exhibit. It is extremely rare to encounter cocaine HCl made from ether and/or acetone in the United States. For CY 2002, over 2,600 cocaine HCl exhibits from seizures within the United States were examined for solvent profiles. Six exhibits (0.2%) were produced by the Bolivian method. One exhibit (0.04%) was produced from the Peruvian method. The processing method for 17 exhibits (0.6%) could not be determined. The remaining 2,633 exhibits (99.1%) were produced by the

Colombian method. Note that for CY 1998 through CY 2001, Colombian processors accounted for 98-99% of the exhibits. **These findings continue to show that the overwhelming majority of cocaine HCl being exported to the U.S. (>98%) is from Colombian-run cocaine HCl laboratories.** It should be noted that some Colombians operate laboratories in Ecuador, especially in the Putumayo Region (which borders Colombia.).

### Recycling of Essential Solvents

Clandestine laboratory operators have been recycling their solvents since the early 1990's. Due to the various types of solvent-A's and B's used primarily in Colombia, the CSP is often able to determine if a cocaine HCl exhibit was manufactured from recycled solvents. As shown below, laboratory results demonstrate that 57% of the exhibits were apparently produced from

**Production of cocaine HCl from recycled solvents**



recycled solvents. Recycling of waste solvents plays a large role in the illicit production of cocaine.

### Chemical Analysis of Cocaine and Related Exhibits Seized Outside the United States

#### Brazil

Three cocaine base and two cocaine HCl exhibits were examined. The base exhibits were 16-52% pure. One base exhibit (24% pure) was cut with benzocaine while the other exhibit (16% pure) was cut with phenacetin. The exhibit of 52%

pure cocaine base originated from Peruvian coca leaf in the Huallaga/Ucayali Valleys. The cocaine HCl exhibits were 64% and 94% pure and originated from coca grown in the Huallaga/Ucayali and Apurimac/Cusco Valleys of Peru, respectively.

#### Colombia

Non-laboratory seizures - Three purple powder exhibits were submitted and determined to be potassium permanganate. A white powder exhibit was determined to be sodium carbonate.

Clandestine lab - Three cocaine HCl exhibits were examined. The purity of the exhibits were 76-79%. All were highly oxidized, of Colombian leaf origin, and produced from recycled solvents.

#### Ecuador

An exhibit consisting of an oily substance was examined. It was determined to be palm oil containing approximately 5% cocaine.

#### Korea

One cocaine HCl exhibit was submitted. The exhibit contained only 2% cocaine and cut with large amounts of caffeine and lidocaine. The cocaine origin could not be determined due to the very low cocaine purity.

#### Mexico

One cocaine HCl exhibit was submitted. The exhibit consisted of 27% cocaine, 31% dimethylterephthalate, and 16% phenacetin. The exhibit was produced from Colombian cocaine base and recycled solvents.

#### Thailand

One cocaine HCl exhibit was examined. The exhibit was 80% pure, moderately oxidized, and of Colombian origin.

\* \* \* \* \*

## SELECTED REFERENCES

[Note: Selected references are a compilation of recent publications of presumed interest to forensic chemists. Unless otherwise stated, all listed citations are published in English. If available, the email address for the primary author is provided as the contact information. Listed mailing address information (which is sometimes cryptic or incomplete) exactly duplicates that provided by the abstracting services.]

1. Cheng W-C, Lee W-M, Chan —F, Phil M, Tsui P, Dao K-L. **Enantiomeric separation of methamphetamine and related analogs by capillary zone electrophoresis: Intelligence study in routine methamphetamine seizures.** *Journal of Forensic Sciences* 2002;47(6):1248. [Editor's Notes: The simultaneous separation of ephedrine, pseudoephedrine, and methamphetamine using CZE with *beta*-cyclodextrin as a chiral selector is presented. Application to the analysis of seized drugs is discussed. Contact: Forensic Science Division, Government Laboratory, Hong Kong, Peop. Rep. China.]
2. Katagi M, Tsutsumi H, Miki A, Nakajima K, Tsuchihashi H. **Analyses of clandestine tablets of amphetamines and their designer drugs encountered in recent Japan** [sic]. *Japanese Journal of Forensic Toxicology* 2002;20(3):303. [Editor's Notes: Presents analyses of various tablets recently seized in Osaka (including tablets containing MDMA, PMA, 2C-T-7, and various tryptamines). Contact: Forensic Science Laboratory, Osaka Prefectural Police H.Q., Chuo-ku, Osaka 541-0053, Japan.]
3. Ye NS, Gu XX, Zou H, Zhu RH. **Separation and determination of ephedrine enantiomers by capillary electrophoresis using l-leucine as chiral selector.** *Chromatographia* 2002;56(9-10):637. [Editor's Notes: The technique was applied to the analysis of *Ephedra* plant extracts. Contact: Gu XX, Capital Normal Univ, Dept Chem, Beijing 100037, Peoples R China.]
4. Bartlett V. **HPLC analysis of narcotic/acetaminophen admixtures. What to do if a compendium method doesn't work.** *The Restek Advantage* 2002;3:6. [Editor's Notes: Discusses modifications to established methods for separating admixtures of compounds with similar structures. Contact: No addressing information was provided.]
5. United Nations Office for Drug Control and Crime Prevention (UNODCCP). **Global Illicit Drug Trends 2002.** [http://www.undcp.org/pdf/report\\_2002-06-26\\_1/report\\_2002-06-26\\_1.pdf](http://www.undcp.org/pdf/report_2002-06-26_1/report_2002-06-26_1.pdf) [Editor's Notes: A 235 page report. Contact: UNODCCP, New York (No further addressing information was provided).]

### Additional References of Possible Interest:

1. Smith JA, Hayes CE, Yoltan RL, Rutledge DA, Citek K. **Drug recognition expert evaluations made using limited data.** *Forensic Science International* 2002;130(2-3):167. [Editor's Notes: Presents the results of a study of the ability and accuracy of law enforcement personnel to determine degree and type of drug intoxication based on face-to-face interviewing and other evidence. Contact: Pacific University College of Optometry, 2043 College Way, Forest Grove, OR 97116.]
2. Melker RJ, Goldberger BA, Gold M. **Method and apparatus for detecting illicit substances.** PCT Int. Appl. WO 2002095359 A2 28 Nov 2002. CLASS: ICM: G01N. Application: WO 2002-US16157 22 May 2002. Priority: US 2001-PV292962 23 May 2001. [Editor's Notes: For



analysis of vapor (breath), using a SAW sensor. Contact: University of Florida (No further addressing information provided).]

3. Thomson G, Batchelder D. **Development of a hand-held forensic-lidar for standoff detection of chemicals.** Review of Scientific Instruments 2002;73(12):4326. [Editor's Notes: Presents a hand-held lidar instrument that allows spectral identification at a distance of 5 meters. Contact: Department of Physics and Astronomy, Molecular Physics and Instrumentation Group, University of Leeds, Woodhouse Lane LS2 9JT, UK.]
4. Hinrichs K-U. **Exploiting the multivariate isotopic nature of organic compounds.** Geochemistry, Geophysics, Geosystems <http://www.g-cubed.org/gc2001/2001GC000142/fs2001GC000142.html> [Editor's Notes: Presents a review and discussion on the need to develop new technologies to study isotopic fractionation processes. Includes remarks on drugs. Contact: Hanse Inst. of Advanced Study, D-27753 Delmenhorst, Germany.]
5. Imaizumi M, Saito Y, Hayashida M, Takeichi T, Wada H, Jinno K. **Polymer-coated fibrous extraction medium for sample preparation coupled to microcolumn liquid-phase separations.** Journal of Pharmaceutical and Biomedical Analysis 2002;30(6):1801. [Editor's Notes: The analysis of of amitriptyline, imipramine, nortriptyline, and desipramine, was carried out with the referenced hyphenated system. The focus is on the analysis of biological samples. Contact: School of Materials Science, Toyohashi University of Technology, Toyohashi 441-8580, Japan.]
6. Aristarkhova AA, Volkov SS, Dmitrevskii YE, Kitaeva TI, Ognev VI, Plotkin DM, Timashev MY. **Characteristics of ion spectroscopy use in forensic science** [sic]. Vzaimodeistvie Ionov s Poverkhnost'yu Materialy Mezhdunarodnoi Konferentsii, 15th, Zvenigorod, Russian Federation, Aug. 27-31, 2001 2001;1:335. [Editor's Notes: Presents a review on the use of ion spectroscopic methods in forensic science. Contact: Nauchno-Issled. Tekhnol. Inst., Ryazan, Russia. This article is written in Russian.]
7. De Boeck G, Wood M, Samyn N. **Recent applications of LC-MS in forensic science.** LC-GC 2002;15(11):19. [Editor's Notes: Presents an overview of the use of LC/MS in forensic science (however, illicit drugs are not specifically covered). Contact: National Institute of Criminalistics and Criminology, Belgium (no further addressing information was provided).]
8. Herraiz-Hernandez R, Campins-Falco P, Verdu-Andres J. **Enantiomeric separation of amphetamine and related compounds by liquid chromatography using pre-column derivatization with o-phthaldialdehyde.** Chromatographia 2002;56(9-10):559. [Editor's Notes: The referenced technique was applied to amphetamine, norephedrine, norepinephrine, and MDA. The focus was on application to biological samples. Contact: Herraiz-Hernandez R, Univ Valencia, Dept Analyt Chem, Dr Moliner 50, Valencia 46100, Spain.]
9. Nikas SP, Thakur GA, Makriyannis A. **Synthesis of side-chain specifically deuterated (-)-delta(9)-tetrahydrocannabinols.** Journal of Labelled Compounds and Radiopharmaceuticals 2002;45(12):1065. [Editor's Notes: A method for specific deuteration on the -pentyl side-chain, with no scrambling, was developed. Contact: Makriyannis A, Univ Connecticut, Dept Pharmaceut Sci, Ctr Drug Discovery, Storrs, CT 06269.]

\* \* \* \* \*

# Notice of Intent to Place *alpha*-Methyltryptamine and 5-Methoxy-N,N-diisopropyltryptamine into Schedule I

[Editor's Preface: This is a pre-publication "courtesy" copy of the CFR notification, and is *not* an exact match of the CFR version. See the CFR for the actual notice.]

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## DEPARTMENT OF JUSTICE

### Drug Enforcement Administration

#### 21 CFR Part 1308

[DEA-238N]

#### Schedules of Controlled Substances: Temporary Placement of *alpha*- Methyltryptamine and 5-Methoxy- N,N-diisopropyltryptamine into Schedule I

**AGENCY:** Drug Enforcement  
Administration (DEA), Justice

**ACTION:** Notice of Intent.

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**SUMMARY:** The Deputy Administrator of the Drug Enforcement Administration (DEA) is issuing this notice of intent to temporarily place *alpha*-methyltryptamine (AMT) and 5-methoxy-N,N-diisopropyltryptamine (5-MeO-DIPT) into Schedule I of the Controlled Substances Act (CSA) pursuant to the temporary scheduling provisions of the CSA. This intended action is based on a finding by the DEA Deputy Administrator that the placement of AMT and 5-MeO-DIPT into Schedule I of the CSA is necessary to avoid an imminent hazard to the public safety. Finalization of this action will impose the criminal sanctions and regulatory controls of a Schedule I substance on the manufacture, distribution, and possession of AMT and 5-MeO-DIPT.

**FOR FURTHER INFORMATION,  
CONTACT:** Frank Sapienza, Chief,  
Drug and Chemical Evaluation Section,  
Office of Diversion Control, Drug  
Enforcement Administration,  
Washington, DC 20537, Telephone  
(202) 307-7183.

#### SUPPLEMENTARY

## INFORMATION:

### Background

The Comprehensive Crime Control Act of 1984 (Pub. L. 98-473) amended section 201 of the CSA (21 U.S.C. 811) to give the Attorney General the authority to temporarily place a substance into Schedule I of the CSA for one year without regard to the requirements of 21 U.S.C. 811 (b) if he finds that such action is necessary to avoid an imminent hazard to the public safety. The Attorney General may extend the temporary scheduling up to 6 months. A substance may be temporarily scheduled under the emergency provision of the CSA if that substance is not listed in any other schedule under section 202 of the CSA (21 U.S.C. 812) or if there is no exemption or approval in effect under 21 U.S.C. 355 for the substance. The Attorney General has delegated his authority under 21 U.S.C. 811 to the Deputy Administrator of DEA (28 CFR 0.100).

Section 201(h)(4) of the CSA (21 U.S.C. 811(h)(4)) requires the Deputy Administrator to notify the Assistant Secretary for Health, delegate of the Secretary of Health and Human Services, of his intention to temporarily place a substance into Schedule I of the CSA. Comments submitted by the Assistant Secretary for Health in response to this notification, including whether there is an exemption or approval in effect for the substance in question under the Federal Food, Drug and Cosmetic Act, shall be taken into consideration before a final order is published.

In making a finding that placing a substance temporarily into Schedule I of the CSA is necessary to avoid an imminent hazard to the public safety, the Deputy Administrator is required to consider three of the eight factors set

forth in section 201(c) of the CSA (21 U.S.C. 811(c)). These factors are as follows: (4) History and current pattern of abuse; (5) The scope, duration and significance of abuse; and (6) What, if any, risk there is to the public health.

### *alpha*-Methyltryptamine and 5-methoxy-N,N-diisopropyltryptamine

*alpha*-Methyltryptamine (AMT) and 5-methoxy-N,N-diisopropyltryptamine (5-MeO-DIPT) are tryptamine (indoleethylamine) derivatives and share several similarities with the Schedule I tryptamine hallucinogens, *alpha*-ethyltryptamine (AET) and N,N-dimethyltryptamine (DMT), respectively. Several other tryptamines also produce hallucinogenic/stimulant effects and are controlled as Schedule I substances under the CSA (bufotenine, diethyltryptamine, psilocybin and psilocin). Although tryptamine itself appears to lack consistent hallucinogenic/stimulant effects, substitutions on the indole ring and the ethylamine side-chain of this molecule result in pharmacologically active substances (McKenna and Towers, J. Psychoactive Drugs, 16: 347-358, 1984).

The chemical structures of AMT and 5-MeO-DIPT possess the critical features necessary for hallucinogenic/stimulant activity. Thus, both AMT and 5-MeO-DIPT are likely to have a pharmacological profile substantially similar to other Schedule I tryptamine derivatives such as DMT and AET. In drug discrimination studies, both AMT and 5-MeO-DIPT substitute for 1-(2,5-dimethoxy-4-methylphenyl)-aminopropane (DOM), a phenethylamine-based hallucinogen in Schedule I of the CSA. The potencies of DOM-like discriminative stimulus effects of these and several other similar tryptamine derivatives correlate well with their hallucinogenic potencies in humans

(Glennon et al., Eur. J. Pharmacol. 86: 453-459, 1983).

AMT shares other pharmacological properties with Schedule I hallucinogens such as AET. AMT increases systolic and diastolic arterial blood pressures. The behavioral effects of orally administered AMT (20 mg) in humans are slow in onset, occurring after 3 to 4 hours and gradually subside after 12 to 24 hours, but may last up to 2 days in some subjects. The majority of the subjects report nervous tension, irritability, restlessness, inability to sleep, blurry vision, mydriasis and equate the effects of a 20 mg dose to those of 50 micrograms of lysergic acid diethylamide (LSD) (Hollister et al., J. Nervous Ment. Dis., 131: 428-434, 1960; Murphree et al., Clin. Pharmacol. Ther., 2: 722-726, 1961). AMT also produces hallucinations and dextroamphetamine-like mood elevating effects.

5-MeO-DIPT also produces pharmacological effects similar to those of other Schedule I hallucinogen such as DMT. The synthesis and preliminary human psychopharmacology study on 5-MeO-DIPT was first published in 1981 (Shulgin and Carter, Comm. Psychopharmacol. 4: 363-369, 1981). 5-MeO-DIPT is an orally active hallucinogen. Following oral administration of 6-10 mg, 5-MeO-DIPT produces subjective effects with an onset at about 20-30 minutes, a peak at about 1-1.5 hours and a duration of about 3-6 hours. Subjects who have been administered 5-MeO-DIPT are talkative and disinhibited. 5-MeO-DIPT causes mydriasis. High doses of 5-MeO-DIPT produce nausea, jaw clenching, muscle tension and overt hallucinations with both auditory and visual distortions.

#### **History and Current Pattern of Abuse**

The popularity and use of hallucinogenic/stimulant substances at raves (all-night dance parties) and other social venues have been a major problem in Europe since the 1990s. In the past several years, this activity has spread to the United States. The Schedule I controlled substance 3,4-methylenedioxymethamphetamine

(MDMA or Ecstasy) and its analogues are the most frequently abused drugs at these raves. Their abuse has been associated with both acute and long-term public health and safety problems. Raves have also become venues for the trafficking and abuse of new, non-controlled substances distributed as legal substitutes for, or in addition to, MDMA. 5-MeO-DIPT and AMT belong to such a group of substances.

Data gathered from published studies, supplemented by reports on Internet websites indicate that these are often administered orally at doses ranging from 15-40 mg for AMT and 6-20 mg for 5-MeO-DIPT. Other routes of administration include smoking and snorting. Data from law-enforcement officials indicate that 5-MeO-DIPT is often sold as "Foxy" or "Foxy Methoxy", while AMT has been sold as "Spirals" at least in one case. Both substances have been commonly encountered in tablet and capsule forms.

#### **Scope, Duration and Significance of Abuse**

According to forensic laboratory data, the first encounter of AMT and 5-MeO-DIPT occurred in 1999. Since then, law enforcement officials in Arizona, California, Colorado, Delaware, Florida, Idaho, Illinois, Iowa, New Jersey, Oregon, Texas, Virginia, Washington, Wisconsin and the District of Columbia have encountered these substances. According to the Florida Department of Law Enforcement (FDLE), the abuse by teens and young adults of AMT and 5-MeO-DIPT is an emerging problem. There have been reports of abuse of AMT and 5-MeO-DIPT at clubs and raves in Arizona, California, Florida and New York. Many tryptamine-based substances are illicitly available from United States and foreign chemical companies and from individuals through the Internet. A gram of AMT or 5-MeO-DIPT as bulk powder costs less than \$150 from illicit sources on the Internet. DEA is not aware of any legitimate medical or scientific use of AMT and 5-MeO-DIPT. There is recent evidence suggesting the attempted clandestine production of AMT and 5-MeO-DIPT

in Nevada, Virginia and Washington DC.

#### **Public Health Risks**

AMT and 5-MeO-DIPT share substantial chemical and pharmacological similarities with other Schedule I tryptamine-based hallucinogens in Schedule I of the CSA (AET and DMT). This makes it likely that these drugs cause similar health hazards. Tryptamine, the parent molecule of AMT and 5-MeO-DIPT, is known to produce convulsions and death in animals (Tedeschi et al., J. Pharmacol. Exp. Ther. 126: 223-232, 1959). AMT and 5-MeO-DIPT, similar to other tryptamine- or phenethylamine-based hallucinogens, through the alteration of sensory perception and judgement can pose serious health risks to the user and the general public. Further, there have been several self-reports on Internet websites describing the reported abuse of these substances in combination with other controlled drugs, namely MDMA, marijuana, *gamma*-hydroxybutyric acid (GHB) and 2,5-dimethoxy-4-(*n*)-propylthiophenethylamine (2C-T-7). This practice of drug abuse involving combinations poses additional health risks to the users and the general public. Available information indicates that AMT and 5-MeO-DIPT lack any approved therapeutic use in the United States. The safety of these substances for use in humans has not been studied.

DEA has considered the three criteria for placing a substance into Schedule I of the CSA (21 U.S.C. 812). The data available and reviewed for AMT and 5-MeO-DIPT indicate that these substances each have a high potential for abuse, no currently accepted medical use in treatment in the United States and are not safe for use under medical supervision.

#### **Role of the Assistant Secretary for Health In Temporary Scheduling**

Section 201(h)(4) of the CSA (21 U.S.C. 811(h)(4)) requires the Deputy Administrator to notify the Assistant Secretary for Health, delegate of the Secretary of Health and Human Services, of his intention to temporarily place substances into Schedule I of the



CSA. Comments submitted by the Assistant Secretary for Health in response to the notification regarding AMT and 5-MeO-DIPT, including whether there is an exemption or approval in effect for the substances in question under the Federal Food, Drug and Cosmetic Act, shall be taken into consideration before a final order is published.

Based on the above data, the continued uncontrolled distribution and abuse of AMT and 5-MeO-DIPT pose an imminent risk to the public safety. DEA is not aware of any recognized therapeutic uses of these substances in the United States.

In accordance with the provisions of section 201(h) of the CSA (21 U.S.C. 811(h)) and 28 CFR 0.100, the Deputy Administrator has considered the available data and the three factors required for a determination to temporarily schedule AMT and 5-MeO-DIPT in Schedule I of the CSA and finds that placement of AMT and 5-MeO-DIPT into Schedule I of the CSA is necessary to avoid an imminent hazard to the public safety.

Because the Deputy Administrator finds that it is necessary to temporarily place AMT and 5-MeO-DIPT into Schedule I to avoid an imminent hazard to the public safety, the final order, if issued, will be effective on the date of publication of the Federal Register. AMT and 5-MeO-DIPT will be subject to the regulatory controls and administrative, civil and criminal sanctions applicable to the manufacture, distribution, possession, importing and exporting of a Schedule I controlled substance under the CSA. Further, it is the intention of the Deputy Administrator to issue such a final order as soon as possible after the expiration of thirty days from the date of publication of this notice and the date that notification was transmitted to the Assistant Secretary for Health.

### Regulatory Certifications

#### *Regulatory Flexibility Act*

The Deputy Administrator hereby certifies that this rulemaking has been drafted in accordance with the Regulatory Flexibility Act (5 U.S.C.

605(b)), has reviewed this regulation, and by approving it certifies that this regulation will not have a significant economic impact on a substantial number of small entities. This action provides a notice of intent to temporarily place AMT and 5-MeO-DIPT into Schedule I of the CSA. DEA is not aware of any legitimate uses of AMT and 5-MeO-DIPT in the United States.

#### *Executive Order 12988*

This regulation meets the applicable standards set forth in Sections 3(a) and 3(b)(2) of Executive Order 12988 Civil Justice Reform.

#### *Executive Order 13132 Federalism*

This rule will not have substantial direct effects on the States, on the relationship between the national government and the States, or on the distribution of power and responsibilities among the various levels of government. Therefore, in accordance with Executive Order 13132, it is determined that this rule will not have sufficient federalism implications to warrant the preparation of a Federalism Assessment.

#### *Unfunded Mandates Reform Act*

This rule will not result in the expenditure by State, local and tribal governments, in the aggregate, or by the private sector, of \$100,000,000 or more in any one year, and it will not significantly or uniquely affect small governments. Therefore, no actions were deemed necessary under provisions of the Unfunded Mandates Reform Act of 1995.

#### *Small Business Regulatory Enforcement Fairness Act of 1996*

This rule is not a major rule as defined by § 804 of the Small Business Regulatory Enforcement Fairness Act of 1996. This rule will not result in an annual effect on the economy of \$100,000,000 or more; a major increase in costs or prices; or significant adverse effects on competition, employment, investment, productivity, innovation, or on the ability of United States-based companies to compete with

foreign-based companies in domestic and export markets.

### List of Subjects in 21 CFR Part 1308

Administrative practice and procedure, Drug traffic control, Narcotics, Prescription drugs, Reporting and Record keeping requirements.

Under the authority vested in the Attorney General by Section 201(h) of the CSA (21 U.S.C. 811 (h)), and delegated to the Deputy Administrator of the DEA by Department of Justice regulations (28 CFR 0.100), the Deputy Administrator hereby intends to order that 21 CFR Part 1308 be amended as follows:

### PART 1308 – SCHEDULES OF CONTROLLED SUBSTANCES

1. The authority citation for 21 CFR Part 1308 continues to read as follows:

**Authority:** 21 U.S.C. 811, 812, 871b, unless otherwise noted.

2. Section 1308.11 is to be amended by adding paragraph (g)(6) and (7) to read as follows:

#### § 1308.11 Schedule I.

\* \* \* \* \*

(g) \* \* \*

(6) *alpha*-Methyltryptamine (AMT), its isomers, salts and salts of isomers - 7432.

(7) 5-Methoxy-N,N-diisopropyl-tryptamine (5-MeO-DIPT), its isomers, salts and salts of isomers - 7439.

\* \* \* \* \*

Dated: \_\_/\_\_/\_\_.

**John B. Brown, III**

Deputy Administrator

[Various Administrative Codes Here]

\* \* \* \* \*

# Computer Corner

## Examination Backlogs - The Management Challenge

# #167

by Michael J. Phelan  
DEA Special Testing  
and Research Laboratory

Digital evidence forensics, of which computer forensics is only a subset, has been the fastest growing forensic sub-discipline for the last decade. It is possible within the next year or two that digital evidence collection at most crime scenes will equal in importance and in number the fingerprint exhibits. Inherent in this phenomenal growth, however, is the concurrent growth of evidence backlogs.

Not surprisingly, therefore, computer forensic examination backlogs are perhaps the single most important issue when the topic of digital evidence is raised. Since the bottom line in this business is the recovery of data accurately, swiftly, and in a court admissible manner, the minimization of backlogs is critical. Hence, it is perplexing that many law enforcement organizations allow significant computer evidence examination backlogs to exist - many in excess of 6 months. In some programs, evidence can languish for years, with minimal or no efforts at remediation. The problem is widespread, affecting Federal, state, and local law enforcement organizations. The impact is even greater. In the worst-case scenarios, investigators may *never* know what was contained on a seized computer. More commonly, the evidence will be examined too late to be useful, or in such a

cursory, rushed manner that case-important information is missed.

The reality is that it's impossible to know the value of the digital evidence in a case until it has been thoroughly examined. There may be nothing of importance - but there could also be definitive leads on a terrorist cell, a kidnapping, or a child pornography exchange ring.

### Trends

Consider these trends in explaining why there are digital evidence examination backlogs: First, submissions are growing at a very rapid rate. For example, DEA Special Agents have been submitting between 20 - 30 percent more exhibits every year for each of the last five years!

Second, the increasing complexity of the technology, and the varied forms of electronic evidence (consisting of computers, diskettes, data tapes, Zip cartridges, cellular telephones, two-way pagers, satellite phones, digital cameras, memory sticks, RAM drives, Personal Digital Assistants, Palm Computers), are both growing geometrically.

Third, the volume of data to be collected and searched is also increasing at an alarming rate, as hard drive capacity increases and cost per megabyte of data

storage decreases. Most medium and large scale digital evidence programs are searching terabytes of data annually (one terabyte is a thousand billion characters or  $1 \times 10^{12}$ ).

Fourth, digital evidence examiner personnel are (still) scarce human resource commodities. Private sector salaries start in the low 60's and often exceed six figures for senior level personnel. These salaries are at the high end of the salary scale compared to other information technology professionals, and have a direct impact on the ability of Federal, state, and local governments to hire personnel to staff their digital evidence programs.

Fifth, there are very few technical training providers, and most training sources offer only a one or two week introductory course. Digital evidence forensic course offerings are infrequent and enrollment is often limited to law enforcement personnel. Only a handful of academic institutions have recognized the need for digital evidence examination courses, and they are still experimenting with curriculum development and distance learning.

### Need to Prioritize

Concomitant with these trends has been a lively internal debate in law enforcement that can best

be described as: “What is Computer Forensics?” This fundamental question takes several forms. First, there is the never-ending argument over whether Computer Forensics is an investigative technology or a forensic science. A corollary to this debate concerns the sufficiency of examination - or simply stated: “What are the minimum requirements?”

### **The Ford Motor Strategy**

There are two competing management philosophies when it comes to approaches to reduce digital evidence backlogs. One theory (the Ford assembly line model) relies on tried and true management principals that state that the key to higher productivity lay in: A) Economies of scale; B) Work simplification; and C) Task specialization. Examples of integrating these concepts into Computer Forensics might include, e.g., centralizing technical support at the state level, or regionalization at the multi-county level, for economy of scale purposes. Another example would be the organization of examiners by functional specialization, such as on-site data collection specialists, basic computer examiners, network examiners, non-Microsoft operating system examiners, and volatile memory examiners.

### **The DNA Strategy**

The competing management philosophy borrows from the relatively recent success within the forensic science community on the handling of DNA evidence. DNA scientists do not examine the entire DNA

sequence when conducting an analysis. Rather, relatively small (but highly critical) segments are analyzed. These segments contain all the information that is needed to determine the degree of match. Similarly, the luxury of examining every last byte of data in a digital evidence case is highly labor intensive and is almost certainly not needed in most exams. Like DNA analyses, a complete digital evidence examination might take weeks - whereas a thorough examination of the critical area(s) may take no more than three to five days.

A second lesson learned from the DNA forensic experience is the recognition that the fundamental nature of computer forensics is forensic science. Accordingly, all of the standard scientific checks and balances must be incorporated into every Computer Forensics program - just as it was for DNA evidence - in order to meet prevailing legal admissibility standards. These checks include examiner training, proficiency standards (and testing), quality assurance programs, and the establishment of “best practices” and proper evidence handling protocols.

However, the adoption of forensically acceptable methods and procedures does not necessarily mean that the service must be provided by a forensic organization or, for that matter, by any particular law enforcement organization or office. The vast majority of computer forensic practitioners nationally are deputy sheriffs, detectives, and Special Agents

that perform Computer Forensics work on only a part time basis. In other instances, the private sector has played a significant role in providing computer forensic services, especially in providing contract examiners.

The important points are that the methods employed must be forensically acceptable, and the provider may be from any of several labor categories, including part-time investigator-examiner, full time government forensic laboratory examiner, or contracted forensic examiner.

### **Minimum Needs**

It seems evident that maintaining the status quo or submitting budget requests with the unending plea of “need more people” will not suffice in an era of fiscal constraints and limited government growth. However, there are some changes that can make a difference. Consider these four elements:

### **Analytical Sufficiency**

First, define what are the minimal information requirements to support a case. Allow flexibility in defining analytical sufficiency based upon the nature of the alleged crime, legal rules of evidence, and prosecution policies. Develop a mechanism to classify and prioritize cases.

### **Network Hierarchies**

Second, recognize that no law enforcement organization stands alone. Resources should be organized within a support structure whereby a part-time examiner can reach out to a regional or state computer forensic laboratory when more

technical types of support are needed. Additional technical support could be provided from a Federal crime laboratory – especially those laboratories providing highly specialized subject matter expertise. Research and development should be restricted to organizations that have adequate budgets and the technical abilities to manage projects from start to finish. Succinctly stated, simplify, specialize, and develop network support hierarchies wherever possible.

### **Evidence is Evidence**

Third, the debate over whether digital evidence examination is an investigative technology or forensic science should be transcended. The focus should be on doing it right. Embrace best practices, control the evidence, institutionalize quality control mechanisms, and ensure examiners are trained and qualified. Remember, “evidence is evidence”.

### **Training Need**

Lastly, the crisis of digital evidence backlogs will not go away until effective national training strategies are in place. This essential infrastructure must include academia, private industry, and government in a partnership that is globally aware, accessible, and relevant to the tasks at hand. Both introductory and advance training are needed, as well as opportunities for internships, and distance learning for working professionals.

### **DEA’s Experience**

DEA has historically struggled with large digital evidence

backlogs. More recently, DEA has adopted a three-fold strategy to reduce its evidence backlog and increase examiner productivity. First, DEA has hired 11 full-time contractors to work on-site at its digital evidence laboratory to supplement the existing DEA examiner workforce. The use of contractors has allowed DEA to have greater flexibility in acquiring a staff that has a wide range of technical skills.

Second, DEA has simplified its software tool kit to include fewer tools to reduce the training burden and simplify the software validation process. This seems paradoxical, since the experience at DEA has shown that multiple tools are often needed to perform basic digital evidence examination tasks such as duplication, file viewing and keyword searching. In fact, the high degree of variability in data storage formats may require the use of several tools before satisfactory results are achieved. Therefore, the purchase of only one or two software examination software suites would appear to be risky given the current complexity and variability of digital evidence. However, too much of a good thing can be equally problematic, and a minimum of two and a maximum of four different tools to perform the same functions (such as duplication, file viewing, keyword searching), is a reasonable compromise.

Third, DEA continues to operate a single digital evidence facility, thus resulting in an economy of scale. The concentration of the entire examiner workforce at one

location means that all digital evidence examination issues can be addressed on-site.

Centralization has also helped eliminate duplication of hardware and software procurements, minimize supply inventories, and most importantly, provide a single focus for field support.

### **Opportunities**

Management should continue to maintain an open mind when addressing digital evidence backlogs. There are multiple solutions to the problem. The history and current operational protocols of each law enforcement organization are different and will affect what works best. Mixed management models, consisting of varying organizational structures (centralized or distributed), labor categories (Agents, civilian technicians or contractors), and examination strategies, will more efficiently utilize the very limited resources currently available. It is important to maintain flexibility and be opportunistic, but also important to remain diligent when it comes to basics - because in the final analysis, evidence is still evidence.

Questions or comments?

e-mail: [mphelan@erols.com](mailto:mphelan@erols.com)

# Microgram

## *Bulletin*

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Washington, DC 20537**

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**VOL. XXXVI, NO. 3**

**MARCH 2003**

**- SAFETY AND INTELLIGENCE ALERT -**

**TNT AS “METHAMPHETAMINE” IN PERRYVILLE, MARYLAND**

The DEA Mid-Atlantic Laboratory (Largo, Maryland) recently received a submission of a piece of aluminum foil containing suspected methamphetamine (see Photo 1). The exhibit was seized by a Maryland State Trooper during a routine traffic stop on Interstate 95 near Perryville, Maryland. When unwrapped, the aluminum foil was approximately one inch in width and three inches in length, and contained 1.0 gram of fine brown powder. Analysis of the powder by GC/MS, FTIR and ITMS (Ion Trap Mobility Spectrometry), however, indicated not methamphetamine but rather 2-methyl-1,3,5-trinitrobenzene, better known as 2,4,6-trinitrotoluene (TNT), a high explosive. The exhibit was subsequently transferred to the Bureau of Alcohol, Tobacco and Firearms National Laboratory in Rockville, Maryland for



**Photo 1**

further analysis and safekeeping. This was Mid-Atlantic Laboratory's first encounter with TNT being submitted as a suspected controlled substance.

[Editor's Notes: This sample appears to resemble a much larger seizure (2.5 kilograms) of TNT reported in the September 2002 issue of *Microgram Bulletin*. In that case, the TNT was being sold as "heroin". Any laboratory encountering similar exhibits is asked to report their findings to the BATF Laboratory, at: 1401 Research Blvd., Rockville, MD 20850; Attn: E. Bender.]

\* \* \* \* \*

### **- INTELLIGENCE ALERT -**

#### **METHAMPHETAMINE/MDMA TABLETS IN COPLEY, OHIO**

The DEA North Central Laboratory (Chicago, Illinois) recently received 99 green tablets, 8.2 x 3.4 mms, with a horse imprint on one side and a single score on the other side, suspected Ecstasy (see Photo 2). The exhibit was purchased in Copley, Ohio, by the DEA Cleveland Resident Office in an undercover operation. Analysis by GC, GC/MS, and FT-IR, however, indicated a mixture of MDMA (19 mg/tablet) and d-methamphetamine (23 mg/tablet). While this combination in Ecstasy tablets is not unusual, the fact that the methamphetamine is the predominant controlled substance is noteworthy. This was the Laboratory's first encounter with these type tablets.



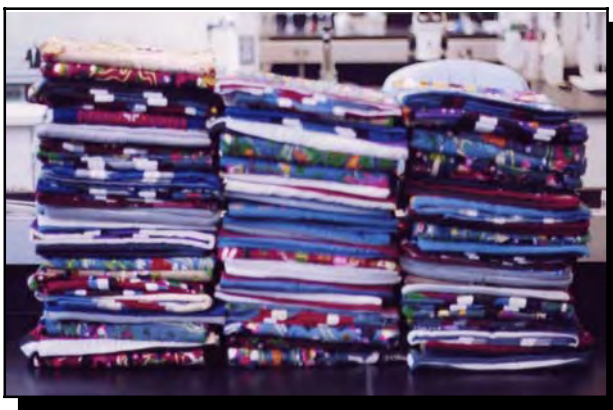
**Photo 2**

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### **- INTELLIGENCE ALERT -**

#### **OPIUM-"STARCHED" BLANKET INSERTS SEIZED AT WASHINGTON/DULLES INTERNATIONAL AIRPORT**

The DEA Mid-Atlantic Laboratory (Largo, Maryland) recently received a submission of 61 small blankets containing suspected opium (see Photo 3). The blankets (total net mass 25.1 kilograms) were aboard a passenger flight originating from Laos (transiting Korea), and were seized by the United States Customs Service at Washington/Dulles International Airport. Each blanket was approximately 3 feet long by 3 feet wide. The blankets themselves did not contain opium; however, each also contained a hard, black



**Photo 3**



cheesecloth-like insert that had an opium-like odor (see Photo 4). Analysis of extracts from this latter fabric by GC and GC/MS confirmed the presence of opium, specifically codeine, morphine, thebaine, papaverine, and noscapine. A representative portion of the blankets was extracted for quantitative analysis, and it was calculated that the total net mass of opium was 9.6 kilograms. This was Mid-Atlantic Laboratory's first encounter with opium-starched blankets.



**Photo 4**

\* \* \* \* \*

### **- INTELLIGENCE ALERT -**

#### **UNUSUAL "ICE" METHAMPHETAMINE EXHIBITS IN STOW, OHIO**

The DEA North Central Laboratory (Chicago, Illinois) recently analyzed two unusual methamphetamine exhibits submitted by the DEA Cleveland Resident Office. The exhibits were obtained in Stow, Ohio via an undercover purchase, and had the appearance of "ICE" (1/4 inch long white crystals). The first had a net mass of 7.0 grams and was packaged in a single, clear zip-lock plastic bag, while the second had a net mass of 3.2 grams and was packaged in 14 small zip-lock plastic bags all contained within a larger zip-lock plastic bag (photos not available). Analysis by GC, GC/MS, and FT-IR, however, indicated not high purity methamphetamine but rather a mixture of methamphetamine and dimethylsulfone. The first exhibit contained only 34% d-methamphetamine hydrochloride, while the second contained only 25% d-methamphetamine hydrochloride.

\* \* \* \* \*

### **- INTELLIGENCE BRIEF -**

#### **UNUSUAL PRISON SMUGGLING METHODS**

Officials at Corcoran State Prison in California report that heroin and methamphetamine are being smuggled into the prison by several unconventional methods. Prison officials report that heavy paper, such as that used to make greeting cards, is soaked in methamphetamine solution. Once dried, the paper is inserted into an envelope and mailed to an inmate. Inmates administer the drug by tearing the paper into small pieces, generally 1-inch squares, and then placing the pieces in their mouths. They either ingest the drug themselves or sell it to others. Prison officials also report that black tar heroin is smuggled into the prison by individuals who place small quantities of the drug between two sheets of paper and press the pages together with an iron. The pages are then included in a stack of documents and mailed to the inmate. Officials further report that methamphetamine and heroin are smuggled into the prison by individuals who

insert small amounts of drugs into five or six colored balloons that are then coated with honey, covered with multi-colored cereal, and placed in boxes of cereal. The cereal boxes are resealed - using a heat sealer and glue - and mailed to inmates.

[Editor's Notes: The above Intelligence Alert was prepared by the Narcotics Drug Intelligence Center (NDIC), and was originally published in the NDIC's *Narcotics Digest Weekly* on January 21, 2003 (reprinted with permission). A similar technique for smuggling methamphetamine into a prison by "starching" coloring book pages was reported by the Arizona Department of Public Safety Southern Regional Crime Laboratory (Tucson, Arizona) in the December 2002 *Microgram Bulletin*.]

\* \* \* \* \*

## **- MEETING BRIEF -**

### **INTERNATIONAL DRUG PROFILING CONFERENCE IN DULLES, VIRGINIA**

On December 2 - 5, 2002, delegates from 11 countries gathered at the DEA Special Testing and Research Laboratory to discuss drug profiling and initiate the development of an International Drug Profiling Database (IDPD). Represented were: Austria, Australia, England, Finland, Germany, Hong Kong, Japan, Sweden, Switzerland, The Netherlands, and the United States. The conference was funded by the Office of National Drug Control Policy (ONDCP) and was hosted by Mr. Thomas J. Janovsky, Deputy Assistant Administrator, DEA Office of Forensic Sciences. Mr. Joseph P. Bono, Quality Assurance Manager, Office of Forensic Sciences, organized and facilitated the meeting. This conference was the first of its type ever held in the United States, and recognized the importance of strategic intelligence gathering and its potential value in determining, monitoring, and interdicting drug trafficking (and thereby impact on a principal funding source for international terrorist groups). Some of the topics included formally defining drug profiling and source determination terms, standardizing critical drug profiling elements, establishing a universal database platform, information distribution and sharing, and establishing a centralized command and control oversight.

Three Subcommittees were established: The first will address the criteria for a heroin database; the second will address the criteria for the amphetamine type stimulants (ATS) database; and the third will develop the criteria for a universal database platform. Additional topics of critical importance (e.g., cocaine) were deferred for later consideration.

Initial reports will be submitted by the three subcommittees by March 25, 2003. The next meeting is tentatively scheduled to be held in June 2003; the delegates from Sweden and Finland both offered to host the next Conference.

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## **Selected Intelligence Brief**

### **THE EVOLUTION OF THE DRUG THREAT: THE 1980'S THROUGH 2002**

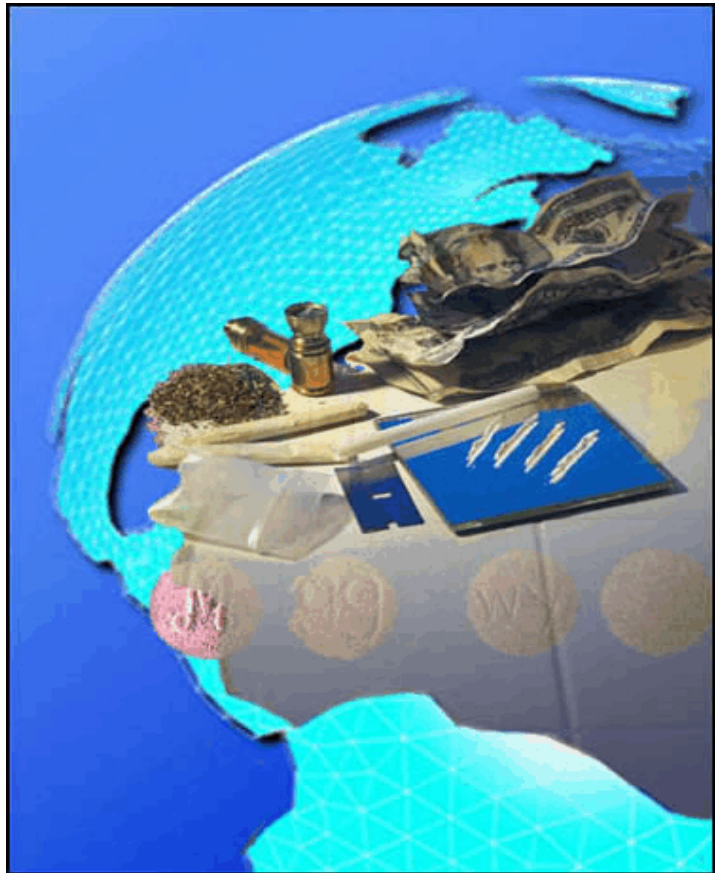
**DEA Intelligence Division  
International Strategic Support Section  
Europe/Asia/Africa Unit**

(202) 307-8726

[Unclassified; Reprinted With Permission]

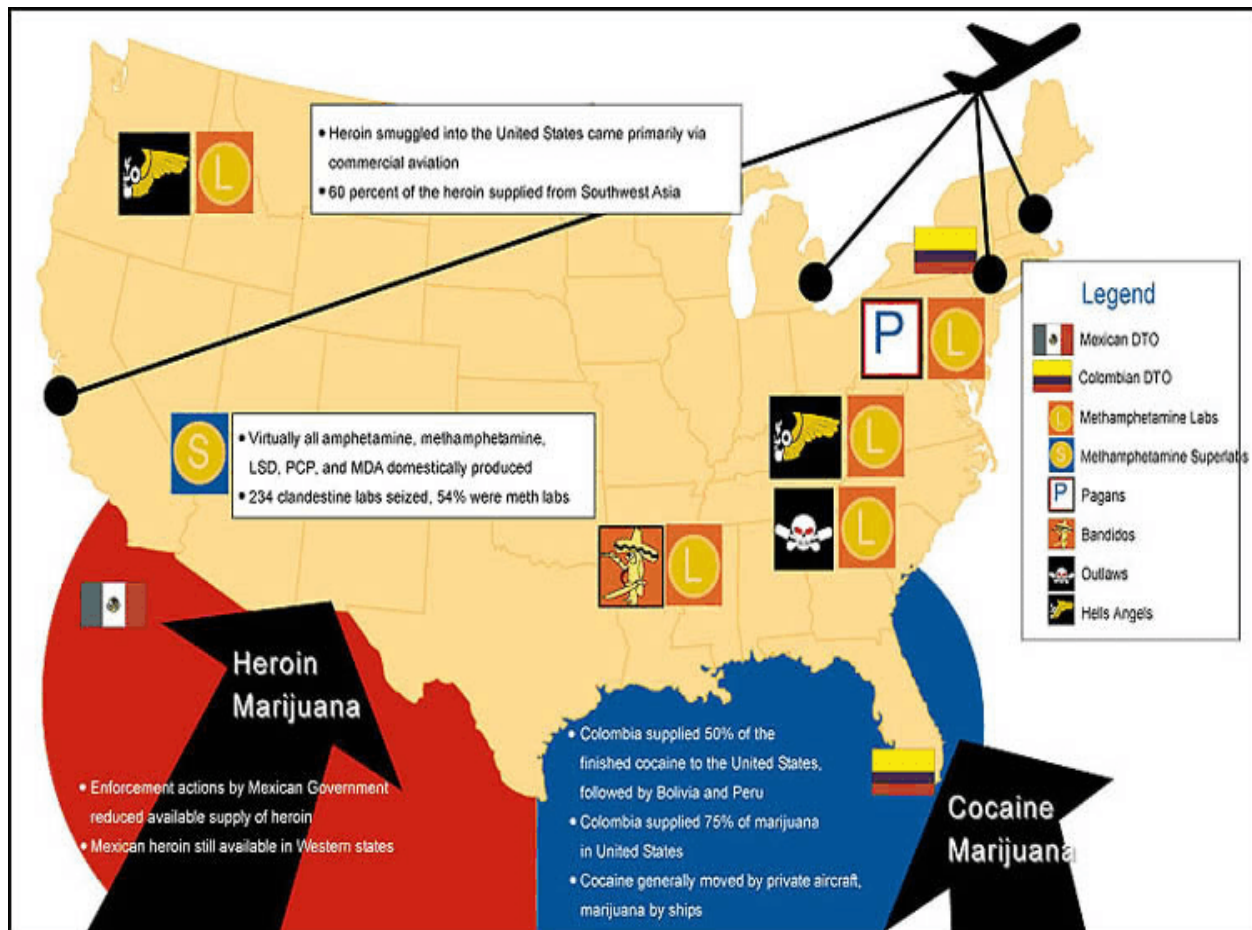
The illicit drug trade in the United States is affected by numerous factors, including consumer demand, sources of supply, the organizational strengths and adaptability of criminal groups, and the ability of law enforcement and interdiction assets to disrupt or dismantle drug distribution systems. Identifying the most significant drug threats to the United States requires the fusion of current intelligence with a historical perspective to fully assess the dynamics of the illicit drug trade.

This report identifies the most significant changes in the drug threat over the past twenty years, as identified in past issues of the National Narcotics Intelligence Consumers Committee Report (NNICC). The first part of the report serves as a historical foundation for a current drug threat assessment, and offers a perspective on the dynamics that will affect the drug threats facing the United States in the near future. The second part of the report provides a summary of the most significant factors shaping the distribution of illicit drugs.



The first-level evaluation of the current drug threat assessment was derived from field division assessments, open-source reports, drug abuse indicators, and reports from the El Paso Intelligence Center (EPIC) and Joint Interagency Task Force East. The second-level evaluation involved a survey of Drug Enforcement Administration (DEA) field managers who precisely identified the most significant drug problems in the field divisions, and the factors that affected those priorities, such as levels of violence associated with the trade, abuse indicators, and the volume of drugs moved. Rather than a comprehensive study of the drug trade, this report provides a snapshot of a highly dynamic criminal environment, and the challenges facing U.S. intelligence and enforcement agencies.

## Drug Smuggling in the 1980's



### The 1980's: A Radical Transformation of the Consumer Market

The single most important transformation of the U.S. illicit drug market in the 1980s was the rampant growth of cocaine trafficking and abuse. Fed by the perception that the drug was a benign stimulant, cocaine trafficking and abuse radically transformed the illicit drug environment. The ready supply of cocaine virtually replaced the demand for the synthetic drug, phencyclidine, or PCP. The introduction of crack cocaine, an easily obtained form of smokeable cocaine, increased demand and fueled violent gang wars between rival suppliers.

Although Bolivia and Peru were the largest coca and cocaine base producers, Colombian traffickers dominated the final production of cocaine hydrochloride. Colombian sources supplied at least 50 percent of the cocaine smuggled to the United States, with Colombian distribution organizations firmly entrenched in South Florida. The Caribbean remained the primary cocaine smuggling corridor, utilizing maritime and air smuggling routes through The Bahamas.

Southwest Asia was the primary source of heroin to the United States, supplying approximately 60 percent of the U.S. heroin market. Pakistan was the largest and most accessible heroin producer in the

region. Opium poppy cultivation in Afghanistan was severely disrupted as a result of the fighting between Soviet forces and the Mujahedeen; however, because interdiction efforts in the country were primarily directed at controlling the flow of weapons to Afghan guerillas, heroin exports continued, albeit at a reduced level. Mexican heroin continued to supply the western United States, although enforcement actions by the Mexican Government severely disrupted heroin sources.

Colombia was the primary source of foreign-produced marijuana in the United States, supplying approximately 80 percent of the marijuana smuggled into the United States. Mexico and Jamaica supplied the balance of the foreign-produced marijuana, with domestic production supplying less than 10 percent of the market. Most of the marijuana from Colombia was smuggled through the Caribbean corridor, using maritime conveyances.

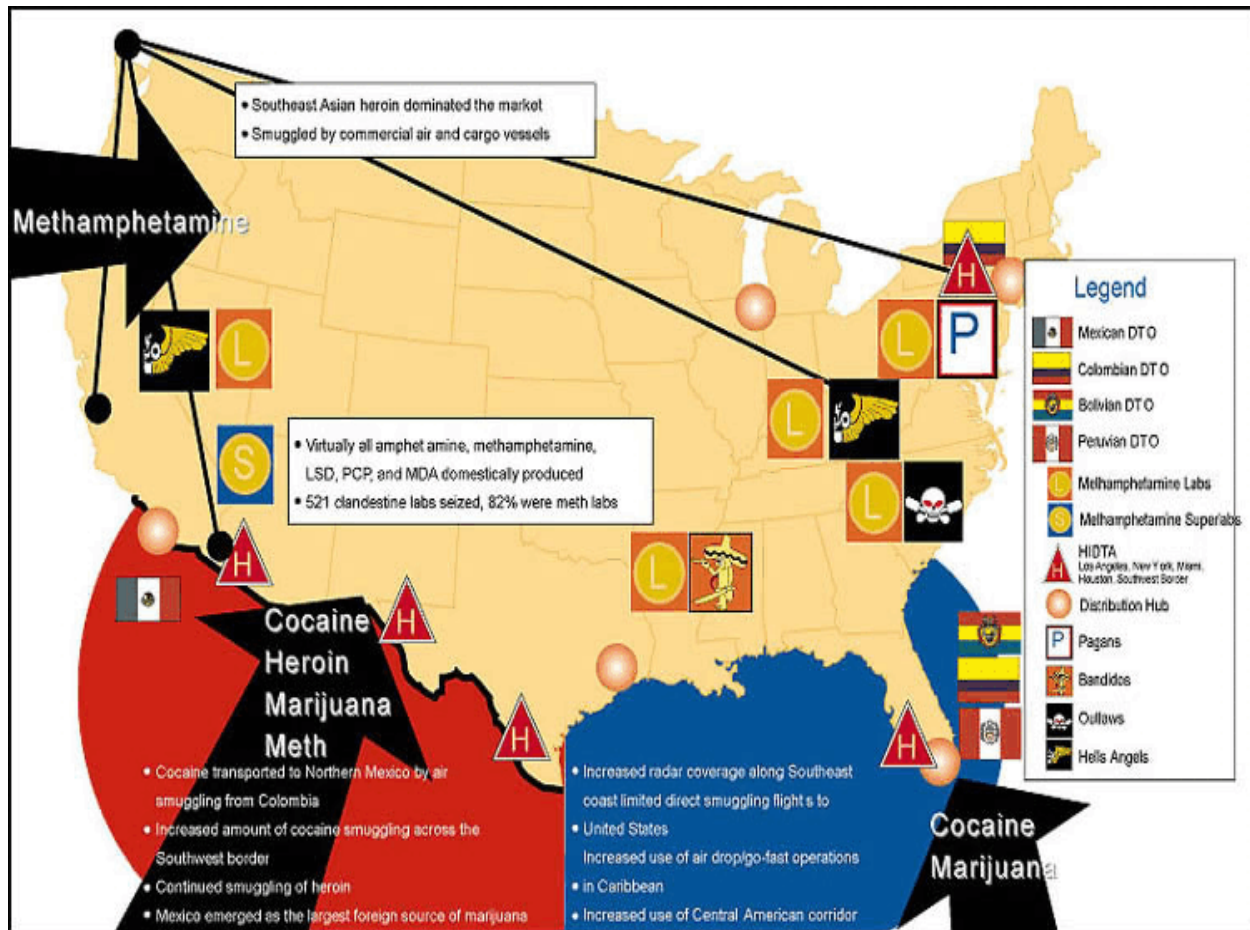
The production and trafficking of synthetic drugs was relatively limited in the 1980s. Domestic clandestine laboratories supplied nearly all of the available synthetic drugs in the United States, with the exception of diverted pharmaceuticals. In 1980, Drug Abuse Warning Network (DAWN) Emergency Room data identified diazepam (Valium) as the most frequently cited cause for admission. Although the majority of clandestine laboratories in the United States produced methamphetamine, PCP was the only clandestinely produced drug that was identified as a significant problem in DAWN Emergency Room data. Outlaw Motorcycle Gangs (OMGs), such as the Hells Angels, the Bandidos, the Outlaws, and the Pagans, dominated the production and trafficking of methamphetamine, as well as marijuana distribution. Lysergic acid diethylamide (LSD) made a comeback in the early 1980s; however, its abuse was limited primarily to California and larger urban areas in the East and Midwest.

The 1980s demonstrated the increasing power of drug trafficking organizations to disrupt civil governance of the cocaine-producing regions. The July 1980 coup in Bolivia, led by Garcia Meza and reportedly backed by the “Santa Cruz Cocaine Mafia,” severely undermined drug control efforts in the country. In 1981, the Colombian paramilitary group M-19 kidnapped Martha Nieves Ochoa, the sister of Medellín cartel head Jorge Luis Ochoa. The cartel responded by organizing a death squad that methodically killed guerillas and their families until Nieves was released. The cartel further directed its squads against journalists and political leaders in an effort to force the repeal of Colombia’s extradition treaty with the United States. In one of the more violent acts of the decade, 95 people, including 12 members of the Colombian Supreme Court, were killed when 42 members of M-19 seized the Palace of Justice in Bogota in 1985. In a common cause with the cartel, M-19 demanded the repeal of the extradition treaty.

The 1980s witnessed substantial changes in the law enforcement and security resources directed against drug trafficking. The resources of the Central Intelligence Agency were brought into the counternarcotics mission by Executive Order in 1982. In 1986, National Security Decision Directive 221 articulated the policy that, “The international drug trade threatens the security of the United States by potentially destabilizing democratic allies.” United States military assets were formally directed to provide support to the counternarcotic mission under the National Defense Authorization Act of 1989.

The Anti-Drug Abuse Act of 1988 authorized the Director of the Office of National Drug Control Policy (ONDCP) to designate regions of the United States as “high intensity drug trafficking areas” (HIDTAs). The diversity of the drug trafficking threat was reflected in the geographic diversity of the initial five HIDTAs: the cities of New York, Los Angeles, Miami, and Houston, as well as the Southwest border (all counties along the United States–Mexico border from San Diego to Brownsville, Texas).

## Drug Smuggling in the 1990's



### 1990's: Supply Shifts

During the 1990s, Mexico emerged as the most significant transshipment corridor for illicit drugs smuggled into the United States. Although cocaine continued to move through the Caribbean corridor, increased radar coverage from Aerostats along the Southeast coast deterred the use of aircraft flights directly to the United States. Traffickers thwarted the increased radar surveillance by combining drug airdrops with high-speed boats operating beyond the range of the new systems. The increased law enforcement and military presence in the Caribbean forced traffickers to explore more elaborate smuggling avenues, including the purchase of Soviet cargo aircraft; a surplus Soviet diesel submarine; and experimentation with semi-submersible vehicles.

Colombian traffickers increasingly relied upon Mexican and Dominican trafficking organizations to smuggle cocaine shipments to the United States. By the mid-1990s, Colombian organizations started paying Mexican transportation organizations with portions of the smuggled cocaine load, with up to half of the load provided to the transporters. This arrangement reduced the need for large financial transactions, and firmly established Mexico-based drug trafficking organizations as significant illicit drug wholesalers in the United States. The Central American corridor was increasingly used for air and

overland cocaine shipments to Mexico. Aircraft were used to move cocaine from Colombia to Northern Mexico. Although smaller, twin-engine aircraft were most often used to smuggle cocaine, larger surplus jet aircraft were also used to transport multi-ton quantities of cocaine.

Drug-related violence continued to undermine government control in South America. Over 150 groups loosely organized in cartels operating out of Medellín and Bogota, dominated the cocaine trade. Colombian insurgent groups such as the Revolutionary Armed Forces of Colombia (FARC) and the Army of National Liberation (ELN) also benefitted from the cocaine trade by taxing narcotics profits; protecting crops, laboratories, and storage facilities; and occasionally extracting payment in weapons. Insurgent groups also carried out kidnappings and terrorism in support of traffickers' aims.

By 1988, Southeast Asian (SEA) heroin dominated the East Coast heroin market, while Mexican heroin was supplied to users in the Western United States. New York was the primary importation and distribution center for SEA heroin, with San Francisco, Seattle, Los Angeles, and Washington also identified as points of entry. SEA heroin continued to dominate the market throughout the early 1990s, all but replacing Southwest Asian heroin. In 1994, however, a joint Royal Thai Government/DEA endeavor - Operation TIGER TRAP - led to the incarceration in Thailand and extradition to the United States of more than a dozen high-level violators who had played key roles in moving SEA heroin to the United States. These successful actions disrupted long-standing SEA heroin trafficking *modus operandi*, not only in Asia, but also in the United States.

Expanded opium poppy cultivation and heroin production in Colombia in the early 1990s allowed Colombian traffickers to fill the void created by the decreased flow of SEA heroin to east coast markets. During the mid-to-late 1990s, Colombian heroin traffickers easily undermined the SEA heroin market with a readily available supply of high-quality, low-priced white heroin. They also undercut their competitors' price and used established, effective drug distribution networks to facilitate supply. Since Colombian heroin, often sold on the street with a purity of 90 percent, can be snorted like cocaine, it avoided the stigma of needle usage; thus, Colombian traffickers had a built-in marketing advantage over traffickers from Southeast or Southwest Asia. Throughout the 1990s, Mexico-supplied heroin continued to dominate user preferences in the Western United States.

By 1990, Mexico was the largest supplier of marijuana to the United States. According to the National Household Survey, the number of then current marijuana users (any use within the past 30 days) decreased from 22.5 million in 1979 to 10.2 million in 1990. Despite decreased demand, the profit margin for marijuana not only fueled Mexican trafficking organizations, but led to an increase in domestic marijuana cultivation - particularly indoor-grow operations producing high-potency marijuana.

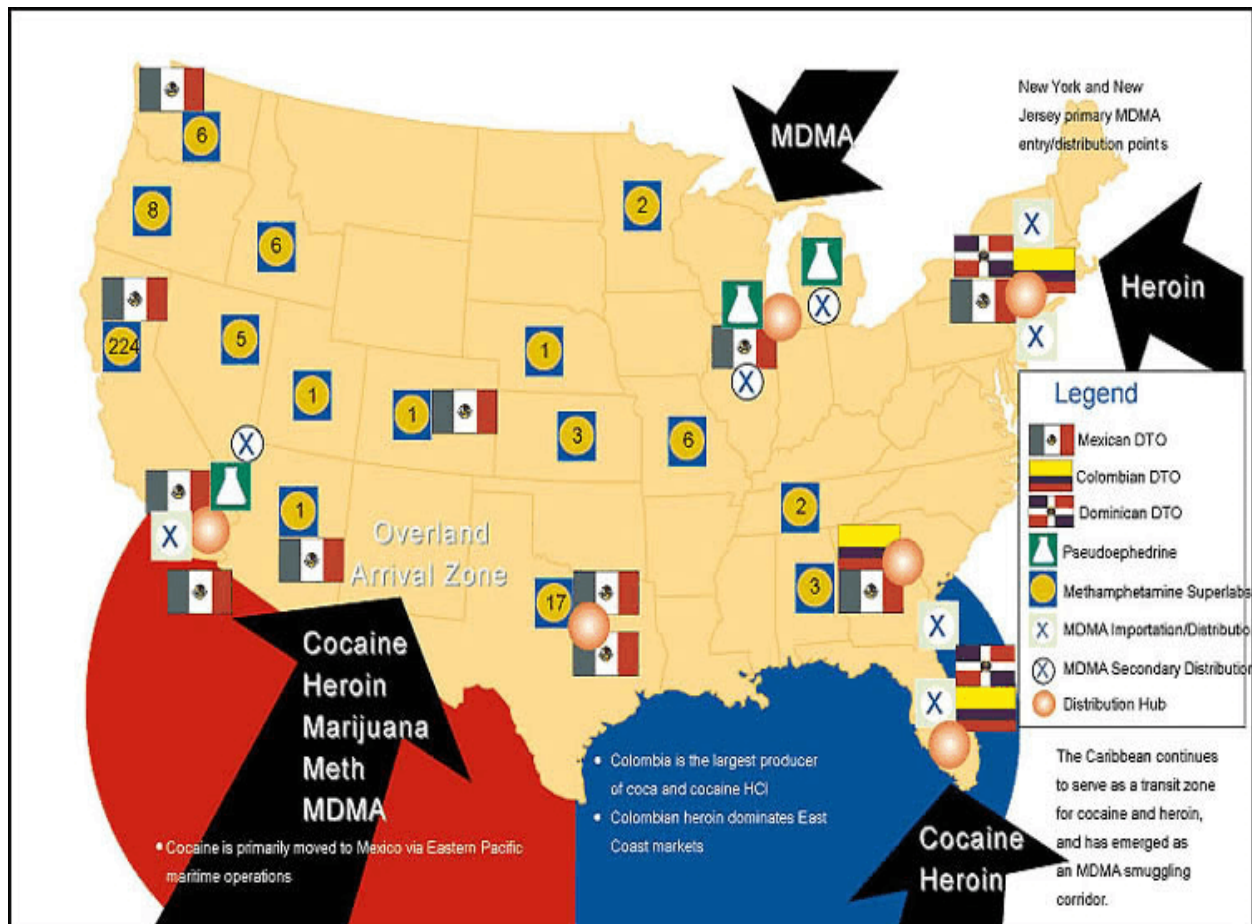
Synthetic drugs, especially methamphetamine, continued to be primarily produced domestically. In the early 1990s, high-purity "ice" methamphetamine (80- to 90-percent pure methamphetamine with a crystalline appearance) appeared on the West Coast. In addition to domestic production, primarily in California, ice was supplied from laboratories in South Korea and the Philippines. OMGs dominated the production of methamphetamine through the early 1990s. In the mid-1990s, however, Mexican drug trafficking organizations started large-scale production and trafficking of methamphetamine. The introduction of high-quality, low-priced methamphetamine undercut the monopoly once held by outlaw bikers. Some OMGs, including the Hells Angels, reportedly relied upon Mexico-based sources of supply for their methamphetamine, preferring to avoid the risks associated with the manufacture of the drug. A sharp decrease in the purity of Mexican methamphetamine at the end of the 1990s reportedly pushed OMGs back into drug production.



LSD and PCP remained available throughout the 1990s. In the late 1980s and early 1990s, methylenedioxymethamphetamine (MDMA) also called Ecstasy, gained popularity among young, middle-class college students in limited areas of the United States. Ecstasy use and availability greatly escalated in 1997 when clandestine laboratories, operating in Europe, began exporting significant quantities of MDMA tablets to distributors in the United States.

## Drug Threat Assessment 2002

### Current Drug Threat



### Regional Abuse Patterns

Most DEA field divisions continue to identify cocaine as the primary illicit drug of concern, based upon abuse indicators, the violence associated with the trade, and/or the volume of trafficking through their areas of responsibilities. Heroin remains readily available in major metropolitan areas. Despite the availability of high-purity white heroin, which can be snorted, abuse appears to have stabilized in recent years. Methamphetamine trafficking and abuse dominate the West Coast and much of the Rocky Mountain and Midwest regions of the country. Polydrug trafficking along the Southwest border continues to tax allocated resources, and cocaine remains the drug of choice along the Atlantic seaboard.

## *Smuggling Patterns*

The Southwest border remains the most vulnerable region of the United States for border security, followed by the Gulf Coast. Interagency assessments report over 60 percent of the cocaine entering the United States moves across the Southwest border. The U.S. Customs Service identified an increase in the movement of drugs between ports of entry over the last several years, as well as a trend toward smaller drug loads. EPIC reports that traffickers have not changed smuggling methods or routes following the September 11, 2001, terrorist attacks. Although the transportation centers are likely to be located near the border, the command and control centers could operate from nearly any location in the United States. Mobile communications and internet encryption allow Drug Trafficking Organizations (DTOs) to operate from remote locations.

## *Availability*

The 9-percent decline in cocaine purity over the past 4 years illustrates a vulnerability of crop-based illicit drugs. One possible explanation for the increased use of cutting agents by Colombian DTOs is the expansion of the non-U.S. drug market beyond the traffickers' means to maintain world supplies. Cocaine and heroin production are limited not only by the same factors that affect any agricultural product, but also by the traffickers' abilities to either control production regions or to thwart government crop eradication efforts. Supplies of synthetic drugs, such as methamphetamine, MDMA or Ecstasy, PCP, and LSD are not limited by these same factors. The traffickers' capability to quickly move production sites of synthetic drugs presents a significant challenge to law enforcement authorities.

## *Cocaine*

Colombian drug trafficking organizations increasingly rely upon the eastern Pacific Ocean as a trafficking route to move cocaine to the United States. Law enforcement and intelligence community sources estimate that 72 percent of the cocaine shipped to the United States moves through the Central America-Mexico corridor, primarily by maritime conveyance. Fishing vessels and go-fast boats are used to move multiton cocaine loads to Mexico's west coast and Yucatan Peninsula. The loads are subsequently broken down into smaller quantities for movement across the Southwest border. Despite the shift of smuggling operations to the eastern Pacific, the Caribbean corridor remains a crucial smuggling avenue for Colombian cocaine traffickers. Puerto Rico, the Dominican Republic, and Haiti are the predominant transshipment points for Colombian cocaine transiting the Caribbean.

Traffickers operating from Colombia continue to control wholesale level cocaine distribution throughout the heavily populated northeastern United States and along the eastern seaboard in cities such as Boston, Miami, Newark, New York City, and Philadelphia. There are indications that other drug trafficking organizations, especially Mexican and Dominican groups, are playing a larger role in the distribution of cocaine in collaboration with Colombian organizations. Mexican drug trafficking organizations are increasingly responsible for the transportation of cocaine from the Southwest border to the New York market. Mexico-based trafficking groups in cities such as Chicago, Dallas, Denver, Houston, Los Angeles, Phoenix, San Diego, San Francisco, and Seattle now control the distribution of multiton quantities of cocaine.

## *Heroin*

The Office of National Drug Control Policy's publication, Pulse Check: Mid-Year 2000, reports new heroin users continue to be attracted to high-purity Colombian heroin because it can be snorted rather

than injected. Reports of Mexico-produced white heroin continue to surface. Although heroin abuse indicators are stable, the increasing purity of Mexican heroin, as well as ready supplies of high-purity white heroin, may result in geographic “pockets” of overdoses as seen in Chimayo and Espanola, New Mexico, in the late 1990s. The high rate of overdose in these locations served as the initial impetus for Operation TAR PIT, which identified the operations of a Mexico-based heroin distribution organization that operated throughout the western United States and in sections of the Midwest.

### ***Marijuana***

Marijuana trafficking is prevalent across the nation, with both domestic and foreign sources of supply. Lax public attitudes regarding marijuana’s effects, the high seizure threshold required for federal prosecution, and various state legalization efforts undermine public support of law enforcement endeavors. The Houston Field Division reports that some Mexican DTOs use marijuana as a “cash crop”; the proceeds are used to cover the expenses associated with the trafficking of other drugs. Multiton seizures of marijuana have had a negligible effect on street prices and availability. Moreover, the increased availability of high-quality sinsemilla and a new generation of marijuana users are threats that cannot be ignored.

### ***Methamphetamine***

Methamphetamine, from either foreign or domestic sources, is available in nearly every DEA field division. Large-scale methamphetamine laboratories, located primarily in the western United States, and to a lesser extent in Mexico, provide the majority of the drug. However, even the smaller clandestine laboratories pose a significant public health and safety threat. The majority of the small toxic laboratories are not connected to large-scale drug trafficking organizations. “Super labs” (laboratories capable of producing in excess of 10 pounds of methamphetamine in one 24-hour production cycle), however, are generally funded and supplied by larger DTOs. An increase in the number of super labs in the Midwest suggests an increased demand for methamphetamine. The increased availability of methamphetamine in urban environments, especially the indications that the drug is occasionally sold in conjunction with, or in place of, club drugs such as MDMA, may usher in a new generation and class of drug abuser. The appearance of Southeast Asian methamphetamine tablets in the United States further threatens to introduce the drug as a substitute for, or supplement to, MDMA, although intelligence reporting on this issue suggests the availability of methamphetamine tablets is isolated. Since methamphetamine laboratories can operate in nearly any remote location, either foreign or domestic, identifying production sources poses a substantial challenge for law enforcement assets at the local, state, and federal levels. One response to the growing problem of clandestine laboratories has been the creation of the National Clandestine Laboratory Database maintained by EPIC. Prior to the creation of this database, there was no reliable system capable of obtaining clandestine laboratory seizure information from state or local investigations. EPIC’s database provides a valuable instrument for both strategic assessments and a clearinghouse for investigative intelligence.

### ***MDMA***

Both field division and epidemiology reports identify club drugs, most notably MDMA, as a significant threat. The increase in domestic MDMA production, although still limited by stringent precursor chemical controls, further illustrates the profitability of this drug. Although the majority of MDMA production takes place in the Netherlands, and to a lesser extent in Belgium, the transferability of the laboratories adds a dynamic to the drug trade that cannot be addressed at this time. Laboratories can be relocated to any nation in the European Union, Eastern Europe, or the former Soviet Union, as long as precursor chemicals can be obtained and transported.



### *Post-September 11, 2001 Assessment*

The September 11, 2001 terrorist attacks on the United States introduced a new set of variables to drug threat assessments: The reallocation of law enforcement, intelligence, and military assets from counternarcotics to counterterrorism reduces available enforcement assets, yet brings a concurrent strengthening of national borders. If history serves as a guide, DTOs will continue to identify and exploit vulnerabilities in order to maintain a steady supply of drugs to the illicit drug market in the United States.

\* \* \* \* \*

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## EMPLOYMENT OPPORTUNITIES

### 1. Johnson County Sheriff's Office Criminalistics Laboratory (2 Positions)

(First Posting)

**Position 1:** DNA Technical Leader/ Forensic Chemist

**Location:** Mission, Kansas (Kansas City metropolitan area)

**Salary:** \$50,564.80 to \$72,280.00 per year

**Application Deadline:** Open Until Filled

**Duties:** This position will serve as the laboratory's DNA Technical Leader and section coordinator. The major duties of this position include overseeing the technical operations of the Biology Section to ensure compliance with the American Society of Crime Laboratory Directors/Laboratory Accreditation Board Standards (ASCLD/LAB) as well as the Quality Assurance Standards for Forensic DNA Testing Laboratories standards. In addition, this position will have some casework responsibility; including evaluating the nature, origin and significance of physical evidence both in the laboratory and at crime scenes; performing physical, chemical, biochemical and genetic analysis of biological material associated with evidence using DNA analysis methods; maintaining laboratory records, preparing written technical reports of analysis, and providing effective expert testimony in courts of law. This position will oversee the training of laboratory examiners and the evaluation and implementation of new scientific techniques for the DNA section of the laboratory. The successful applicant will also be a commissioned Deputy Sheriff.

**General Requirements:** Candidates must meet the educational and experience requirements for a DNA Technical Leader as published in Section 5.2 of the Quality Assurance Standards for Forensic DNA Testing Laboratories (U.S. Department of Justice, Federal Bureau of Investigation, 07/15/98). These guidelines are available on-line at:

<http://www.cstl.nist.gov/biotech/strbase/dabqas.htm> Candidates without a Master's degree must already possess a waiver of the degree requirements as provided in section 5.2.1.1 of the above standards. The successful candidate must also meet the minimum qualifications of a Deputy Sheriff.

The applicant will be required to successfully complete the Kansas Law Enforcement Training Center curriculum. Also, the applicant will be required to successfully complete a laboratory training program in biology and a qualifying test before beginning independent casework responsibilities.

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**Position 2:** Firearms and Tool Mark Examiner

**Location:** Mission, Kansas (Kansas City metropolitan area)

**Salary:** \$50,564.80 to \$72,280.00 per year

**Application Deadline:** Open Until Filled

**Duties:** The major duties include examining firearms for function; comparison with bullets and cartridge cases; serial number restoration; GSR examination of clothing associated with firearm cases; and tool mark examinations. Other duties may be assigned based upon the qualifications of the successful applicant. The successful applicant will become a commissioned Deputy Sheriff and will be required to complete the Kansas Law Enforcement Training Center curriculum. Also, the successful applicant will be required to successfully complete a qualifying test before beginning independent casework responsibilities.

**General Requirements:** A minimum of three years of experience in firearm and tool mark examination. Experience must include the completion of a two-year, full-time training program under the direction of an experienced firearms and tool mark examiner. In addition, the successful candidate must have a least one-year of experience doing independent casework examination and being qualified as an expert witness in a court of law in the area of firearms and tool mark examination. Experience with the National Integrated Ballistic Information Network (NIBIN) and familiarity with the Association of Firearms and Tool Mark Examiners' (AFTE) Guidelines and the American Society of Crime Laboratory Directors/Laboratory Accreditation Board's (ASCLD/LAB) Standards is desired. Applicants must also meet the minimum qualifications of a Deputy Sheriff.

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**Application Procedures for both Positions:** Applications can be obtained by contacting the Sheriff's Department Personnel Division at the following address.

Johnson County Sheriff's Department, Personnel and Training, 125 N. Cherry, Olathe, KS 66061; Phone: (913) 791-5511 (or Toll Free at: (866) 262-3744).

Additional Information about this position can be obtained from Director L. Keith Kerr at the Crime Laboratory by calling: (913) 826-3209.

The Johnson County Sheriff's Department does not discriminate on the basis of race, color, national origin, sex, religion, age, or disabled status in employment or the provision of programs and services.

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## **2. Oklahoma State Bureau of Investigation**

(First Posting)

**Position:** Senior Criminalist, Drug Analysis

**Location:** Lawton, Oklahoma

**Salary:** \$46,250 per year

**Application Deadline:** Open Until Filled

**Duties:** Plan and perform advanced scientific and technical analysis of physical evidence in criminal cases, report on, and testify in court as expert witness. Successful applicants for OSBI Criminalist are required to become certified law enforcement officers in the state of Oklahoma, and are therefore required to satisfy related requirements, including a psychological examination. Applicants must possess the ability and willingness to perform job-related travel; willingness to carry and use deadly force, or less than lethal force, as required. Applicants must be willing and able to be called back to work at irregular times during the evenings and on weekends, willing to transfer where needed and to accept assignments anywhere in the state.

**Minimum Requirements:** A baccalaureate degree in Chemistry, Biochemistry, Criminalistics, Forensic Science, or a closely related field and three years or more of experience as a laboratory criminalist. Preference is given to those applicants whose coursework includes General Chemistry, Organic Chemistry, and Analytical Chemistry. The required experience must be in the analysis and identification of controlled dangerous substances (drugs) and marijuana, and/or in the analysis and identification of controlled substances (drugs) and alcohol in human blood, all using GC and GC/MS instrumental analysis.

**Application Procedures:** Application Procedure: Send resume and photocopy of all transcripts (certified copies are not required) to:

Phyllis Decker, HR Management Specialist  
OSBI Human Resources Section  
6600 North Harvey  
Oklahoma City, OK 73116  
Fax: (405) 842-0675  
E-mail: [phyllisd@osbi.state.ok.us](mailto:phyllisd@osbi.state.ok.us)

EEO

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## **THE DEA FY - 2003 STATE AND LOCAL FORENSIC CHEMISTS SEMINAR SCHEDULE**

The remainder of the FY - 2003 schedule for the DEA's State and Local Forensic Chemists Seminar is as follows:

June 9 – 13, 2003

September 15 – 19, 2003

Note that the school is open only to forensic chemists working for law enforcement agencies, and is furthermore intended for chemists who have already completed their agency's internal training program and have been working on the bench for at least one year. There is no tuition charge for this course. The course is held in Northern Virginia, near the Washington/Dulles International Airport. For additional information, eligibility requirements, or to enroll, see the September 2002 issue of *Microgram Bulletin*, or call 703 668-3337.

# Computer Corner

## Digital Evidence Laboratory Accreditation

# #168

by Michael J. Phelan  
DEA Special Testing  
and Research Laboratory

A major milestone was reached in the Fall of 2002, when the American Society of Crime Laboratory Directors (ASCLD/LAB) formally recognized the subdiscipline of Digital Evidence. ASCLD/LAB recognition is significant, and means that Digital Evidence programs seeking accreditation will be held to the same standards as the other, more traditional forensic sciences (e.g., drug analysis or fingerprint identification).

The potential benefits of ASCLD/LAB accreditation are substantial. Prosecutors, judges, and defense attorneys will become more accepting of digital evidence admissibility, handling, and examination protocols, because accreditation means that the laboratory has validated evidence examination procedures, evidence handling safeguards, and support infrastructure. The resulting products will therefore be considered to be more consistent and reliable. This should in turn result in fewer requests to testify (i.e., more stipulations), thereby saving valuable examiner time and increasing conviction rates.

ASCLD/LAB recognition has been one of the long-term goals of the Scientific Working Group on Digital Evidence (SWGDE). SWGDE is a group of Federal, state, and local subject matter

experts that have been meeting regularly to discuss digital evidence issues since 1999. SWGDE has reduced the complex and fast evolving technology of digital evidence to its core essence, and crafted evaluation criteria for digital evidence programs that are consistent with the existing ASCLD/LAB inspection standards for the more traditional forensic subdisciplines. These criteria accommodate the unique aspects of digital evidence while maintaining the more general concepts common to all forensic sciences.

Many of the ASCLD/LAB inspection criteria mimic standard themes such as examiner training and evidence handling. For example, the digital evidence training requirement covers the universal need to have professional development, staff development seminars, and technical training.

However, more significant differences exist in the area of evidence handling and control. Some of the unique features of digital evidence include the recognition that automated analysis of either original or duplicate evidence may have to proceed unattended during overnight or weekend runs. Similarly, the relatively large size of computers means that

locked cabinets or lock boxes are not feasible for securing evidence while an examiner is away from the work bench. Therefore, the evidence needs to be more generally secured in a "limited access" area such as a work area that is restricted to only examiner personnel.

The concern for evidence integrity is further strengthened by the requirement to scan evidence for computer viruses using current anti-virus software. Similar to concerns with, e.g., biological evidence, issues such as loss, cross-transfer, contamination, and/or destructive analysis are all matters that concern digital evidence examiners.

Other general inspection issues include a requirement for a quality assurance program that includes an annual proficiency test. ASCLD/LAB has recognized three digital evidence specializations: Computer Forensics, Audio, and Video and Imaging. The scope of the proficiency tests for these separate subdisciplines has yet to be determined. SWGDE is focusing on this requirement because it is considered to be an essential element by ASCLD/LAB.

Currently, there is no external proficiency test provider - and in fact only a few agencies such as

DEA and the FBI are even performing annual *internal* proficiency testing. Clearly, this is an issue that needs to be promptly addressed, so that all Digital Evidence programs can participate in the ASCLD/LAB accreditation process.

The ASCLD/LAB Digital Evidence inspection section also downgrades the basic educational qualifications for practitioners by rating as “important” (not “essential”) the need for “a baccalaureate degree with some science courses.” In most other forensic science subdisciplines, the baccalaureate degree requirement is rated by ASCLD/LAB as “essential” (i.e., mandatory). The decision by ASCLD/LAB to allow a lower educational requirement is a significant compromise, which recognizes that the educational background of the vast majority of Information Technology practitioners’ is quite often informal, consisting of a multitude of technical courses and sometimes rather unusual work backgrounds.

It will still be many months before the first Digital Evidence ASCLD/LAB laboratory inspection. Most likely, it will not occur until late 2003. In the interim, prospective inspectors with excellent subject matter expertise need to be identified and trained. Given the overall lack of digital evidence practitioners, this will not be a trivial matter. Proficiency tests need to be developed for the three recognized specializations (Computer Forensics, Audio, and Video and Imaging). Practice inspections need to be

conducted to determine the suitability and practicality of the proposed inspection protocols.

It is important to understand that the establishment of digital evidence laboratory inspection criteria will only apply to organizations that wish to be ASCLD/LAB accredited.

However, a broader impact beyond the forensic community will undoubtedly be realized in the years ahead. Probably 85% or more of the current digital evidence examination practitioners are not located in a forensic or crime laboratory.

Instead, these examiners are members of investigative or enforcement agencies such as police departments, sheriffs’ offices, or prosecutors’ offices.

In many cases, the digital evidence examination “group” is just a single individual. In other cases, their digital evidence examination activities are only part-time. ASCLD/LAB recognition of the Digital Evidence subdiscipline raises the bar for everyone, and a comprehensive set of recognized “Best Practices” standards needs

to be established for (and followed by) all non-ASCLD/LAB accredited organizations who are involved in the collection and/or analysis of digital evidence. Fortunately, there are already at least three “Best Practices” documents available on the Internet in draft or final form. They are: 1) SWGDE Best Practices (draft) at [www.swgde.org](http://www.swgde.org); 2) the International Organization on Compute Evidence (IOCE) at [www.ioce.org](http://www.ioce.org); and 3) the International Association of Computer Investigation

Specialists (IACIS) at [www.cops.org](http://www.cops.org).

Longer term, ASCLD/LAB is rapidly moving to adopt international standards (ISO 17025) which will bring the North American, European, Asian, and Australian forensic communities together. Despite the milestone achievement of ASCLD/LAB to recognize the Digital Evidence subdiscipline, it is evident that the last chapter in Digital Evidence laboratory inspection criteria has not yet been written.

If you want to get further information on the accreditation topic or ISO-17025 topic, contact ASCLD/LAB at [www.ASCLD/LAB.org](http://www.ASCLD/LAB.org), or the National Center for Forensic Sciences at [www.ncfs.ucf.edu](http://www.ncfs.ucf.edu).

Questions or comments?  
E-mail [mpheylan@erols.com](mailto:mpheylan@erols.com).



# Microgram

## *Bulletin*

**Published by:**

**The Drug Enforcement Administration  
Office of Forensic Sciences  
Washington, DC 20537**

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**VOL. XXXVI, NO. 4**

**APRIL 2003**

**- INTELLIGENCE ALERT -**

**ROLL OF PARTIALLY BURNED CURRENCY INCLUDED IN “ICE”  
METHAMPHETAMINE SEIZED IN NOGALES, ARIZONA**

The DEA Southwest Laboratory (Vista, California) recently received an interesting submission consisting of two exhibits of “ICE” methamphetamine and a roll of partially burned U.S. currency (see Photo 1). The evidence was seized by the United States Custom Service in Nogales, Arizona, during a routine vehicle stop. The three packages varied in size, each was wrapped in gray duct tape and clear plastic, and none had any special markings. All three were initially suspected to contain methamphetamine. When opened for analysis, the two larger packages were in fact found to contain a combined net mass of 1,914 grams of an off-white,



**Photo 1**

crystal-like substance, which was confirmed to be 99 percent d-methamphetamine HCl (commonly referred to as "ICE"). The smallest package, however, a softball sized package that was about one third the size of the other two packages, was found to contain \$4,980.00 in U.S. currency, most of which was partially burnt (see Photo 2). The currency included various denomination bills (\$20, \$50, and \$100). U.S. currency is seldom encountered by the Southwest Laboratory, and partially burnt currency in a drug seizure is quite unusual.



**Photo 2**

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**- INTELLIGENCE ALERT -**

**HASHISH SMUGGLED INSIDE SPOOLS OF THREAD  
IN MEMPHIS, TENNESSEE**

The DEA South Central Laboratory (Dallas, Texas) recently received a package containing four spools of white thread containing packages of suspected hashish. The package was seized by the United States Custom Service in Memphis, Tennessee, after X-ray analysis indicated an anomalous mass under the threading of each spool. [However, there was no apparent deformation of the threading on the spools.] The exhibits were submitted to the laboratory after a controlled delivery in Picayune, Mississippi. Disassembly of each spool revealed a rectangular strip, packaged in brown tape, which had been wrapped around the spool cannister, then covered with tightly wound thread (see Photos 3 and 4). Analysis by microscopic examination, Modified Duquenois-Levine, and GC/MS confirmed hashish, combined net mass 387.9 grams. The THC content was not quantitated. This is believed to be the first exhibit of this type ever submitted to the South Central Laboratory.



**Photo 3**

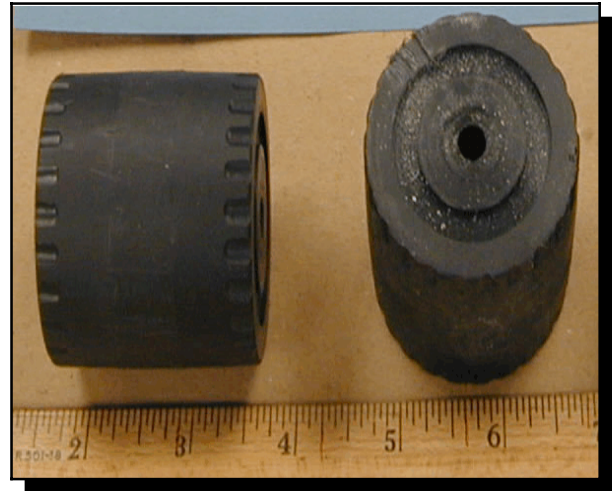


**Photo 4**

**- INTELLIGENCE ALERT -**

**HEROIN IN SUITCASE WHEELS AT JFK AIRPORT, NEW YORK**

The DEA Northeast Laboratory (New York, New York) recently received an exhibit consisting of twelve black suitcase wheels containing suspected heroin (see two of these wheels in Photo 5). The wheels were seized by the United States Custom Service at JFK Airport, New York, after being removed from a suitcase from a passenger arriving on a flight from Colombia. Each wheel contained a black plastic bag, which contained chunks of light brown powder, combined net mass 795.5 grams. Analysis by GC-FID, FT-IR, and GC-MSD confirmed 89 percent heroin HCl. Over the past few years, the Northeast Laboratory has received a wide variety of exhibits seized by Customs agents at JFK Airport, including luggage handles, shoes, suitcase liners, clothing, etc., in which heroin had been concealed.



**Photo 5**

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**- INTELLIGENCE ALERT -**

**L/V LOGO TABLETS CONTAINING COCAINE AND METHORPHAN  
IN SPARTANBURG, SOUTH CAROLINA**

The DEA Southeast Laboratory (Miami, Florida) recently received an exhibit consisting of 42 greenish blue tablets, 8 millimeters in diameter, with a logo apparently consisting of an L over a V (or a V over an L) (possibly a trademark for the designer Louis Vuitton), suspected Ecstasy (see Photo 6). The tablets, net mass 6.7 grams, were seized in Spartanburg, South Carolina by the DEA Greenville (South Carolina) Resident Office Enforcement Group. Analysis by GC/FID and GC/MS, however, indicated not MDMA but rather a mixture of cocaine (1.3 milligrams per tablet, salt form not determined) and methorphan (not quantitated, isomer and salt form not determined). This is the laboratory's first encounter with these type tablets.



**Photo 6**

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**- INTELLIGENCE ALERT -**

**LSD MICROTABLETS IN OWATONNA, MINNESOTA**

The Minnesota Bureau of Criminal Apprehension Forensic Science Laboratory (St. Paul, Minnesota) received a submission of a brownie, Rice Krispie(r) bar, and two very small, brown, round biconvex tablets. All three exhibits were seized by the Owatonna Police Department; the brownie and Rice Krispie(r) bar were submitted as containing marijuana, and the tablets as containing LSD. Examination of the brownie and Rice Krispie(r) bar (photos not available) by microscope revealed no visual plant material. However, analysis by Duquenois-Levine and GC/MS confirmed the presence of *delta*-9 tetrahydrocannabinol (THC); quantitation not performed. The tablets (see Photo 7) were 2.5 millimeters in diameter by 1 millimeter thick, and had no markings. Analysis by color testing with *para*-dimethyl-aminobenzaldehyde (DMAB) / HCl and by GC/MS confirmed lysergic acid diethylamide (LSD); quantitation not performed. This was the laboratory's first encounter with LSD microtablets.



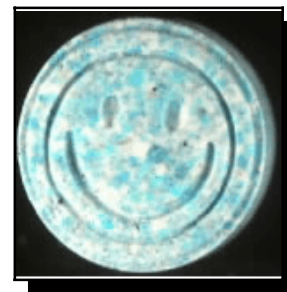
**Photo 7**

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**- INTELLIGENCE ALERT -**

**APPLE LOGO TABLETS CONTAINING PIPERONAL AND TRACE MDMA  
IN STRASBOURG, FRANCE**

The French Customs laboratories in Strasbourg and Paris, France recently analyzed a submission of 1,685 tablets being smuggled from The Netherlands, suspected Ecstasy. The seizure was made by the French Customs Service on the eastern French border. The submission included tablets of two different types: Blue tablets with a "smiley face" logo and a single score on the opposite face (7.1 x 4.2 millimeters, approximately 200 milligrams each, see Photo 8); and white tablets with an "apple" logo, unscored (9.0 x 3.4 millimeters, approximately 300 milligrams each, see Photo 9). [The total number of blue versus white tablets was not determined.] Analysis by GC/FID, GC/MS, FTIR, and HPLC confirmed that the blue tablets contained 68 milligrams of MDMA/tablet. However, the white tablets contained primarily piperonal with less than one percent MDMA. The white tablets were also very heterogeneous: In four analyzed tablets, the piperonal content varied from 36 to 76 milligrams/tablet. The laboratory concludes that the white tablets likely resulted from an incorrect clandestine synthesis. Piperonal is a hazardous and irritant chemical. This was the laboratories' first encounter with "piperonal tablets".



**Photo 8**



**Photo 9**



## **Selected Intelligence Brief**

### **The “Dirty” and Dangerous Side Effects of Synthetic Drugs Production**

**Europol  
Synthetic Drugs Unit  
Raamweg 47  
PO Box 90850  
2509 LW The Hague  
Netherlands**

[Unclassified; Reprinted With Permission]

#### **Part 1: “By-Products - Chemical Waste”**

In recent years the production of synthetic drugs such as ecstasy, amphetamine and other amphetamine type stimulants has dramatically increased. Although the number of illicit laboratories discovered in the European Union has stabilised, the professionalism and production capacity of such sites has increased significantly, not only for the production of synthetic drugs but also in the production of precursors and reductors. A synthetic drug is the end product of a chemical process, as indicated by the word “synthesis” meaning: A reaction between two or more chemicals. Synthetic drugs are therefore chemical products dependent the required chemicals for their production or the availability of such chemicals.



Legitimate chemical processes are undertaken in specially created environments, such as chemical factories, using highly sophisticated equipment, pure chemicals and the necessary chemical knowledge where, even then, chemical waste will be an unavoidable by product. During the illicit production of synthetic drugs huge amounts of waste will result. According to expert estimations, the production of 1 kg amphetamine or ecstasy will, depending on the production method used, result in 5 to 20 litres of waste (i.e. the Leuckart synthesis produces more waste than reductive amination). Furthermore, during specific steps of the production process, certain amounts of solvents will vaporise and thereby pollute the atmosphere.

Chemical waste is a combination of the chemicals used, the by-products and the end products. As more than 200 different chemicals can be used in synthetic drug production, the resultant waste will vary significantly in terms of content and hazardous properties such as flammability, explosiveness, toxicity, corrosiveness, oxidation, carcinogens and others.

The “quality” of the waste will differ, depending on the following circumstances:

The production processes used.

The quality of the chemicals and equipment used.

The knowledge and relative efficiency of the (illicit) chemist and his methods.

The chemical mixture ratio; i.e. if excess chemical is added to a process, the surplus will be converted into chemical waste which must be removed.

The mixture of different waste products; i.e. individual production steps result in different waste which might be mixed and stored together.

In most cases analysed, the chemical waste content exists of one or more of the following chemicals: acetone, ether, methanol, iso-propanol, toluene formamide, caustic soda, ammonia, sulphuric acid, hydrochloric acid, residues of benzylmethylketone, piperonylmethylketone, iso-safrol, etc.

Such ‘illicit’ chemical waste is often stored in old jerry cans, barrels and other means of storage without proper safety labels and warnings. The uncontrolled existence of such chemical ‘cocktails’ poses great danger to the environment, the public and law enforcement.



It is clear that, in the dismantling of synthetic drugs laboratories and the associated collection of evidence, including sampling, such hazards necessitate the adoption of extreme precautions and safety measures.

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## Part 2: “Methods of Dumping”

In the first article “The dirty and dangerous side effects of synthetic drugs production – part 1 by products - chemical waste” an overview is given on the amount and kind of waste which results from the production of synthetic drugs. If we focus on the consumer market demand, with millions of tablets consumed each week, it is clear that the scale of illicit production of synthetic drugs must be enormous. Such large-scale production not only results in millions of tablets but also in huge amounts of chemical waste.

The waste is a combination of the chemicals used, the by-products and the end products. Waste will vary significantly in terms of content and hazardous properties such as flammability, explosiveness, toxicity, corrosiveness, oxidation, carcinogens and others. If such waste is “produced” by legitimate companies, the disposal of the waste will be very expensive and is, in most countries, under tight national and

international legislative control. Permits are necessary for storage, transport and disposal. Such control measures have one significant objective: the safety of the environment and the public.

Producers of synthetic drugs do so for the sole purpose of making money. They do not want to spend their profit on the safe disposal of chemical waste. Another reason is the inherent risk of being caught by law enforcement. They are spending significant amounts of money on the purchase of precursors, chemicals and production equipment such as tableting machines, reaction vessels etc. Producers do actually also use equipment that is normally used in connection with environmental protection but in these cases their reason is still for financial savings. E.g. the use of distillation machines (see below and Europol Drugs Intelligence Bulletin no.1).

Distillation machines are generally used in industry for cleaning used solvents, thereby decreasing the amount of chemical waste and the inevitable cost of waste disposal plus enabling the re-use of expensive chemicals. Producers of synthetic drugs are using these machines solely to facilitate the re-use of the cleaned expensive chemicals. The remaining resultant part of the cleaning process, the removed impurities, will be dumped illegally.

Another related example is the use of carbon filters that are normally used to clean the air of chemical gases such as those from solvents. If used by criminals in synthetic drug production the purpose will also be to purify the air but not for the safety of the environment and public but to prevent discovery of the site via the detection of chemical gasses. The Carbon filter will also be dumped after use.

There are several known methods of dumping chemical waste. Most of the below mentioned methods are carried out during the night in rural or abandoned areas. However, there are known cases in which the chemical waste was dumped in industrial areas and in one case in the middle of a large city near a school.

### **1. Dumping of Closed Drums and Jerry Cans with Misleading Labels / Warnings.**

In almost all cases the criminals use the jerry cans and barrels which were originally used for the transport and storage of the necessary production chemicals. In some cases labels and warning were found on the jerry cans and barrels. However, in none of these cases did the content correspond to the labels. In such cases never rely on the labels / warnings or absence of them. Labels should however be collected as evidence.

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### **2. Emptying drums and jerry cans directly onto the soil.**

Criminals dump the jerry cans or drums in rural and abandoned areas, but in this scenario they will open the jerry cans or drums before dumping their contents. The result will be significant soil and air



pollution, depending on the contents of the jerry cans. There is also the risk of explosion. One of the reasons for the use of this method is that criminals want to prevent law enforcement officers and forensic experts from taking samples of the waste for analysis and/or profiling.

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### 3. Emptying Drums and Jerry Cans into Rivers, Canals and Ditches.

Contents of jerry cans and drums are also poured into rivers, canals and ditches. In these cases the chemical waste will be mixed with the surface water and will be transported over a long distance, spreading the pollution.

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### 4. Leaving Large Amounts of Filled Jerry Cans and Drums in Stolen Vehicles.

Stolen vans are used for the storage, transport and disposal of the chemical waste. In these cases vans are stolen during the night hours, mostly from industrial sites. The vehicle is loaded with jerry cans, drums and in some cases gas cylinders and then driven to another area and abandoned. If the stolen van is discovered, the chemical content must be removed by a specialist chemical company, costing the original owner a lot of money. In most cases the cost of removal of the chemicals will not be covered by their vehicle insurance.

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## 5. Setting Fire to Stolen Vans Loaded with Chemical Waste / Gas Cylinders.

Large amounts of full jerry cans, drums and sometimes also hydrogen gas cylinders are loaded into stolen vans which are driven to abandoned areas and set on fire. This method is becoming more common. In the Netherlands, in 1999, the Unit for Synthetic Drugs (USD) recorded 16 stolen vans, which were set on fire, of which 14 exploded. A burning vehicle with the unknown element of such a 'chemical bomb' creates great dangers for law enforcement officers and investigating firemen.



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## 6. Disposal of Chemical Waste from a Moving Van.

In this case, witnesses observed a van driving several times along the same road. Local residents detected the odour of acetone and alerted the police. After investigation, two drums were found, each containing 250 litres of chemical waste from synthetic drug production. With the use of a compressor, connected to the car cigarette lighter, chemical waste was disposed from the vehicle via a PVC pipe.



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## 7. Burying Full Drums and Jerry Cans in the Soil.

There is also the method of burying jerry cans or drums. In some minor cases buried jerry cans were found, containing chemical waste from the production of synthetic drugs. In a wood, criminals removed the top layer of the soil, dumped the jerry cans into the hole and covered them with soil. This is not a frequently used method due to the fact other methods are easier and burying waste takes times, thereby increasing the chance of detection.



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## 8. Pumping Chemical Waste into the (Local) Sewerage System.

Chemical waste is also drained into the sewerage system. One of the simplest ways is via the use of the lavatory or the bath. In some cases criminals have connected the production process to the sewerage system, with the use of PVC pipes. As long as they dispose of relatively small amounts of diluted chemical waste and the distance to the water purification plant is long enough, they are unlikely to be detected.



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[Note: Selected references are a compilation of recent publications of presumed interest to forensic chemists. Unless otherwise stated, all listed citations are published in English. If available, the email address for the primary author is provided as the contact information. Listed mailing address information (which is sometimes cryptic or incomplete) exactly duplicates that listed by the abstracting services.]

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## THE DEA FY - 2003 STATE AND LOCAL FORENSIC CHEMISTS SEMINAR SCHEDULE

The remainder of the FY - 2003 schedule for the DEA's State and Local Forensic Chemists Seminar is as follows:

June 9 – 13, 2003

September 15 – 19, 2003

Note that the school is open only to forensic chemists working for law enforcement agencies, and is intended for chemists who have completed their agency's internal training program and have also been working on the bench for at least one year. There is no tuition charge for this course. The course is held in Northern Virginia, near the Washington/Dulles International Airport. For additional information, eligibility requirements, or to enroll, see the September 2002 issue of *Microgram Bulletin*, or call 703 668-3337.

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## EMPLOYMENT OPPORTUNITIES

### 1. Johnson County Sheriff's Office Criminalistics Laboratory (2 Positions)

(Second  
Posting)

**Position 1:** DNA Technical Leader/ Forensic Chemist

**Location:** Mission, Kansas (Kansas City metropolitan area)

**Salary:** \$50,564.80 to \$72,280.00 per year

**Application Deadline:** Open Until Filled

**Duties:** This position will serve as the laboratory's DNA Technical Leader and section coordinator. The major duties of this position include overseeing the technical operations of the Biology Section to ensure compliance with the American Society of Crime Laboratory Directors/Laboratory Accreditation Board Standards (ASCLD/LAB) as well as the Quality Assurance Standards for Forensic DNA Testing Laboratories standards. In addition, this position will have some casework responsibility; including evaluating the nature, origin and significance of physical evidence both in the laboratory and at crime scenes; performing physical, chemical, biochemical and genetic analysis of biological material associated with evidence using DNA analysis methods; maintaining laboratory records, preparing written technical reports of analysis, and providing effective expert testimony in courts of law. This position will oversee the training of laboratory examiners and the evaluation and implementation of new scientific techniques for the DNA section of the laboratory. The successful applicant will also be a commissioned Deputy Sheriff.

**General Requirements:** Candidates must meet the educational and experience requirements for a DNA Technical Leader as published in Section 5.2 of the Quality Assurance Standards for Forensic DNA Testing Laboratories (U.S. Department of Justice, Federal Bureau of Investigation, 07/15/98). These guidelines are available on-line at:

<http://www.cstl.nist.gov/biotech/strbase/dabqas.htm> Candidates without a Master's degree must already possess a waiver of the degree requirements as provided in section 5.2.1.1 of the above standards. The successful candidate must also meet the minimum qualifications of a Deputy Sheriff.

The applicant will be required to successfully complete the Kansas Law Enforcement Training Center curriculum. Also, the applicant will be required to successfully complete a laboratory training program in biology and a qualifying test before beginning independent casework responsibilities.

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**Position 2:** Firearms and Tool Mark Examiner

**Location:** Mission, Kansas (Kansas City metropolitan area)

**Salary:** \$50,564.80 to \$72,280.00 per year

**Application Deadline:** Open Until Filled

**Duties:** The major duties include examining firearms for function; comparison with bullets and cartridge cases; serial number restoration; GSR examination of clothing associated with firearm cases; and tool mark examinations. Other duties may be assigned based upon the qualifications of the successful applicant. The successful applicant will become a commissioned Deputy Sheriff and will be required to complete the Kansas Law Enforcement Training Center curriculum. Also, the successful applicant will be required to successfully complete a qualifying test before beginning independent casework responsibilities.

**General Requirements:** A minimum of three years of experience in firearm and tool mark examination. Experience must include the completion of a two-year, full-time training program under the direction of an experienced firearms and tool mark examiner. In addition, the successful candidate must have a least one-year of experience doing independent casework examination and being qualified as an expert witness in a court of law in the area of firearms and tool mark examination. Experience with the National Integrated Ballistic Information Network (NIBIN) and familiarity with the Association of Firearms and Tool Mark Examiners' (AFTE) Guidelines and the American Society of Crime Laboratory Directors/Laboratory Accreditation Board's (ASCLD/LAB) Standards is desired. Applicants must also meet the minimum qualifications of a Deputy Sheriff.

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**Application Procedures for both Positions:** Applications can be obtained by contacting the Sheriff's Department Personnel Division at the following address.

Johnson County Sheriff's Department, Personnel and Training, 125 N. Cherry, Olathe, KS 66061; Phone: (913) 791-5511 (or Toll Free at: (866) 262-3744)

Additional Information about this position can be obtained from Director L. Keith Kerr at the Crime Laboratory by calling: (913) 826-3209.

The Johnson County Sheriff's Department does not discriminate on the basis of race, color, national origin, sex, religion, age, or disabled status in employment or the provision of programs and services.

\* \* \* \* \*

## **2. Oklahoma State Bureau of Investigation**

(Second Posting)

**Position:** Senior Criminalist, Drug Analysis

**Location:** Lawton, Oklahoma

**Salary:** \$46,250 per year

**Application Deadline:** Open Until Filled

**Duties:** Plan and perform advanced scientific and technical analysis of physical evidence in criminal cases, report on, and testify in court as expert witness. Successful applicants for OSBI Criminalist are required to become certified law enforcement officers in the state of Oklahoma, and are therefore required to satisfy related requirements, including a psychological examination. Applicants must possess the ability and willingness to perform job-related travel; willingness to carry and use deadly force, or less than lethal force, as required. Applicants must be willing and able to be called back to work at irregular times during the evenings and on weekends, willing to transfer where needed and to accept assignments anywhere in the state.

**Minimum Requirements:** A baccalaureate degree in Chemistry, Biochemistry, Criminalistics, Forensic Science, or a closely related field and three years or more of experience as a laboratory criminalist. Preference is given to those applicants whose coursework includes General Chemistry, Organic Chemistry, and Analytical Chemistry. The required experience must be in the analysis and identification of controlled dangerous substances (drugs) and marijuana, and/or in the analysis and identification of controlled substances (drugs) and alcohol in human blood, all using GC and GC/MS instrumental analysis.

**Application Procedures:** Application Procedure: Send resume and photocopy of all transcripts (certified copies are not required) to:

Phyllis Decker, HR Management Specialist  
OSBI Human Resources Section  
6600 North Harvey  
Oklahoma City, OK 73116  
Fax: (405) 842-0675  
E-mail: [phyllisd@osbi.state.ok.us](mailto:phyllisd@osbi.state.ok.us)

\* \* \* \* \*

## SCIENTIFIC MEETINGS

1. **Title:** Mid-Atlantic Association of Forensic Sciences (MAAFS) Annual Meeting (First Posting)  
**Sponsoring Organization:** Mid-Atlantic Association of Forensic Sciences  
**Inclusive Dates:** May 5 - 9, 2003  
**Location:** Annapolis, MD (Sheraton Barcelo)  
**Meeting Registration Procedure, Deadline, and Costs:** [See website]  
**Recommended Lodging (Registration Deadline and Costs):** [See website]  
**Contact Individual's Name, Phone Number, and email Address:** [See website]  
**Website:** [\[www.maafs.org/annualmeeting.htm\]](http://www.maafs.org/annualmeeting.htm)

\* \* \* \* \*

2. **Title:** Annual New England Seminar in Forensic Sciences (First Posting)  
**Sponsoring Organization:** Colby College, Special Programs  
**Inclusive Dates:** August 10 - 14, 2003  
**Location:** Colby College, Waterville, ME  
**Meeting Registration Procedure, Deadline, and Costs:** [See website]  
**Recommended Lodging (Registration Deadline and Costs):** [See website]  
**Contact Individual's Name, Phone Number, and email Address:** Jesse Davis, 207/872-3386 (FAX -3383),  
[summer@colby.edu](mailto:summer@colby.edu)  
**Website:** [\[www.colby.edu/spec.prog/cme..html\]](http://www.colby.edu/spec.prog/cme..html)

\* \* \* \* \*

3. **Title:** 3<sup>rd</sup> European Academy of Forensic Science Triennial Meeting (First Bimonthly Posting)  
**Sponsoring Organization:** European Academy of Forensic Science  
**Inclusive Dates:** September 22 - 27, 2003  
**Location:** Istanbul, Turkey (Istanbul Convention Centre)  
**Meeting Registration Procedure, Deadline, and Costs:** [See website]  
**Recommended Lodging (Registration Deadline and Costs):** [See website]  
**Contact Individual's Name, Phone Number, and email Address:** [No Contact Name Provided, +90 212 287-5800 (FAX 263-4581, [eafs2003@enfsi.org](mailto:eafs2003@enfsi.org))]  
**Website:** [\[www.eafs2003.enfsi.org\]](http://www.eafs2003.enfsi.org)

\* \* \* \* \*

## THE JOURNAL/TEXTBOOK COLLECTION EXCHANGE

### *FREE TO ANY SUBSCRIBER*

#### 1) *Microgram* Archives - Final Offer

In mid-2002, the Office of Forensic Sciences completed a comprehensive reorganization and inventory of its entire *Microgram* archive 1967 – 2002. As a result, several thousand excess monthly issues, dating

back to 1971, were identified. These issues were first offered in the September 2002 issue of *Microgram Bulletin*, with the specification that they were intended to fill "holes" in existing collections (not to create new, partial collections), and over 500 issues were requested in that spirit. The remaining issues are now available to any current *Microgram* subscribing office **that has a law enforcement affiliation** (all issues 1967 to 2002 were and remain law enforcement restricted). The Office also has several dozen "bound" (2 year) issues, and these are available to libraries only at this time.

All issues are now available on a first come/first serve basis, including to those who wish to create a "best possible" partial collection. Note that there are many gaps in the available archive (including many entire years), and only a very few available copies for other issues. It is therefore quite unlikely that any request can be completely satisfied. Also note that the condition of the available issues vary from "mint" to only "fair".

Requests should be emailed to the *Microgram* Editor at: [microgram\\_editor@mailsnare.net](mailto:microgram_editor@mailsnare.net) Requests should include complete mailing address information. Note that the entire remaining collection will eventually be destroyed, so interested subscribers should respond as soon as possible. [Note: Postage will be covered by the DEA Office of Forensic Sciences.]

\* \* \* \* \*

## 2) *Journal of Chemical Information and Computer Sciences* Collection - **Final Offer**

The following, partial collection of the journal *Journal of Chemical Information and Computer Sciences* is offered free of charge to any subscriber who wants it, on an all-or-nothing basis (i.e., no "cherry picking" of single issues). Note that the focus of this journal is primarily theoretical in nature (i.e., it is not an analytical journal). Libraries will be given preference. If interested, please contact the Editor at: [microgram\\_editor@mailsnare.net](mailto:microgram_editor@mailsnare.net) [Note: Postage will be covered by the DEA Office of Forensic Sciences.]

*Journal of Chemical Information and Computer Sciences* - 1995 - 1999 (missing 1995(6) and 1998(5)).

If there are no responses, this collection will be discarded one month after the hard copy of the April 2003 issue (this issue!) is mailed; therefore, interested subscribers should contact the Editor as soon as possible.

\* \* \* \* \*

## 3) *FBI Crime Laboratory Digest*

The following issues of the FBI's *Crime Laboratory Digest* are offered to any current *Microgram* subscribing office **that has a law enforcement affiliation** (all issues are law enforcement restricted):

Year;Volume(Number)

1984;11(4)  
1985;12(1)  
1986;13(3) and (4)  
1987;14(1), (2), (3), and (4)  
1988;15(1) and (3)  
1989;16(2)  
1990;17(1)

1992;19(1) and (2)  
1993;20(1), (2), and (4)  
1994;21(4)  
1995;22(4)  
1996;23(2)

If interested, contact the donor at: [rparsons@ircc.edu](mailto:rparsons@ircc.edu)

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Note that the next offering of journals and textbooks will be in the July 2003 issue of *Microgram Bulletin*. Subscribers who are interested in donating items or collections should consult the *Microgram* website for instructions.

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### **Special Request for 2003 Journals (from the Harrison Medical Library / Johns Hopkins Bayview Medical Center)**

Recently, a large journal subscription vendor went bankrupt. Many libraries had already paid for their 2003 journal subscriptions, but the vendor had not paid the publishers before filing for bankruptcy. Due to fiscal restraints and unfavorable budgetary timelines, most of the libraries that were caught up in this situation will not be able to reorder their journals.

We are seeking to help these libraries get through this crisis. You can help. If you subscribe to **any** 2003 journal, but do not retain your issues after reading them, and are willing to donate them, please let me know (contact info below). I will in turn offer these issues to any libraries needing them. Thank you in advance for your help.

Tillie Horak  
Library Information Specialist  
Harrison Medical Library  
Johns Hopkins Bayview Medical Center  
4940 Eastern Avenue  
Baltimore, MD 21224

Phone: 410/550-0678  
FAX: 410/550-2465

email: [thorak@jhmi.edu](mailto:thorak@jhmi.edu)

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# Computer Corner

DEA Digital Evidence Laboratory Established

## #169

by Michael J. Phelan  
DEA Special Testing  
and Research Laboratory

Effective January 23, 2003 DEA elevated its forensic digital evidence program to full laboratory status, establishing the Digital Evidence Laboratory in Lorton, Virginia (about 20 miles south of Washington, DC). The decision to create a separate laboratory dedicated to digital evidence signified the increasing importance of the program within DEA.

### The Trend

The concept of a Digital Evidence Laboratory is not new either in law enforcement or in the private sector. Both the FBI and the Department of Defense already have well established laboratories, staffed by full time examiners who are highly experienced in the examination of computers and similar electronic devices seized in criminal cases. Computer forensics laboratories also exist within the private sector; typically, however, these latter programs process civil discovery tasks involving large amounts of corporate computer data (for example, searches for pertinent documents involved in tobacco, asbestos, or other product liability lawsuits), or provide in-house examination support for investigations involving computer security or computer or Internet misuse. In a related endeavor, some private sector laboratories specialize in highly technical data recovery from damaged hard drives and other

storage media. This latter specialization has become increasingly important when essential data on hard drives are intentionally or inadvertently damaged.

### A Short History

DEA has operated a formal digital evidence program since October 1994. Initially, the function was assigned to DEA's Engineering Section. A new Unit, designated "Computer Forensics", was established within the Section, and was tasked with developing the necessary protocols to recover, in a court admissible manner, information of investigative value from the hard drives of seized computers. DEA (correctly) surmised that such information could greatly assist the identification of co-conspirators, trafficker assets, and related information.

When first started, the initial feeling within the Engineering Section was that the already extensive diversity and complexity of computer technology would make timely data recovery very challenging. Despite these difficulties, however, the program was an immediate success.

In June 1999, the Computer Forensics Unit was reassigned to the DEA Office of Forensic Sciences, and then relocated to the Special Testing and Research

Laboratory (then located in McLean, Virginia). Six years of successful operations by the Unit had proved that hard drive data recovery was very valuable to drug investigations. The reassignment to the Office of Forensic Sciences took the already established engineering capability and supplemented it with basic forensic science operational protocols, including evidence handling and accountability, examiner proficiency testing, sub-discipline accreditation, and method validation. The reassignment was also made in anticipation that the prosecutors, defense attorneys, and judges would expect the same level of proficiency from Computer Forensics that they received from the other, more established forensic sub-disciplines such as fingerprint identification, drug analysis, or DNA testing.

By January 2003, the Computer Forensic Group of the DEA Special Testing and Research Laboratory had grown to 17 personnel, and the program had been relocated from McLean to Lorton because of its growing size. DEA also recognized that the Digital Evidence program merited greater organizational visibility commensurate with its specialized role within DEA. In fact, the name of this new DEA laboratory (Digital Evidence) symbolized the technical reality that computers, the Internet, and



digital communications are rapidly converging, and also that a wide variety of digital consumer electronic devices could and likely would be submitted as evidence. The Digital Evidence Laboratory has therefore developed examination protocols for both seized computers and also volatile memory devices such as two-way pagers, satellite phones, personal digital assistants, and GPS navigational devices.

### **Scope of Operation**

Unlike the DEA's other eight laboratories, which service either a specific region of the United States or the DEA foreign offices, the Digital Evidence Laboratory services all DEA offices, both domestic and abroad.

### **Organizational Strategy**

Continued examiner staffing shortages, and anticipated budget constraints, will require DEA to maintain a centralized program for the immediate future in order to maximize its limited resources. In the longer term, distributing some digital evidence analysis capability to the other DEA laboratories may be considered in order to enhance field response times.

Centralized operations have several advantages:

### **Technical Synergism**

First, the consolidation of relatively scarce technical personnel at one location allows for cooperation and synergism among the laboratory examiner staff. This manifests itself in several ways, such as group problem solving and cooperative

assistance in training new examiners.

### **Specialization**

A second benefit of centralization is specialization. The hiring and training of the examiner staff can be customized to meet the technical demands of the parent organization. At DEA, there is a heavy demand for examination of Windows-based stand-alone computers, Windows NT- or 2000-based business servers, SCO Unix-based systems hosting specialized pharmacy database software, and consumer digital communication electronic devices. Other organizations will likely have different specialization requirements.

### **Cost Savings**

A third and very important advantage of centralization is cost savings. DEA's Digital Evidence Laboratory shares many specialized resources, thereby maximizing the utility of the personnel, computer equipment, and software. For example, DEA operates a single, dedicated computer to crack file passwords (usually a very time-consuming task). Use of this specialized computer therefore eliminates the need for the examiners to process password cracking software on their examination computers, thereby freeing up the latter computers to complete all of the other tasks required for a typical examination in a more timely fashion. Similarly, only a few portable computer systems are needed in order to handle on-site hard drive duplication requests from the field.

### **Economy of Scale**

A fourth important benefit of centralization is its economy of scale. Several expensive laboratory infrastructure components are almost infinitely scaleable. For example, a properly designed evidence vault can store 500 computers as easily as it can store 50 computers. A technical library can support 100 examiners as easily as 10 examiners. An alarm system can protect a 10,000 square foot laboratory as easily as a 1,000 square foot facility.

### **Parallel Evolution**

The establishment of a Digital Evidence Laboratory by DEA parallels the recent recognition by ASCLD/LAB of the digital evidence sub-discipline (see Computer Corner #168 for more on ASCLD/LAB accreditation of digital evidence programs). Member laboratories can now have their digital evidence programs inspected and accredited. Three specialty areas are now recognized by ASCLD/LAB – Computer Forensics, Digital Audio Forensics, and Digital Video Forensics.

### **The Challenge**

Laboratory managers need to assess if the time has come to include a digital evidence section within their crime laboratory system. Most law enforcement organizations already have such programs, although only a small minority of these programs are organized within these organizations' respective crime laboratories. Most programs within criminal law enforcement organizations

are currently considered to be an investigative methodology.

In the private sector, computer forensic laboratories have evolved within the corporate IT computer security sector, or as part of their litigation support/audit staff. At present, in the private sector, individual examiner qualifications and/or external certifications are considered to be more important than program accreditation.

The high standards required in judicial discovery will have a significant future impact on how both government law enforcement agencies and private sector computer forensic organizations manage their digital evidence programs. One key component to success will be how their programs are organized.

Questions or comments:

E-mail: [mphelan@erols.com](mailto:mphelan@erols.com)



# Microgram

## *Bulletin*

Published by:

The Drug Enforcement Administration  
Office of Forensic Sciences  
Washington, DC 20537

The U.S. Attorney General has determined that the publication of this periodical is necessary in the transaction of the public business required by the Department of Justice. Information, instructions, and disclaimers are published in the January issues.

VOL. XXXVI, NO. 5

MAY 2003

**- INTELLIGENCE ALERT -**

**2C-I - A NEW AMPHETAMINE TYPE STIMULANT IDENTIFIED IN DENMARK**

[From the Europol *Drugs Intelligence Bulletin* 2002;2:7  
Unclassified; Reprinted with Permission.]

The Danish authorities have reported a seizure, in April 2002, of a tablet with the amphetamine type stimulant 2C-I (2,5-dimethoxy-4-iodophenethylamine). This is the only seizure report received by the Europol Drugs Unit on tablets with this particular active agent. However, other sources reveal that similar seizures have been made in Toronto, Canada and Milwaukee, USA.

In each case the tablet has been white with a diameter of 6 to 6.1 mm, a thickness of 2.7 mm and displaying the "i" logo. Shown is a photo [Photo 1] of the tablet seized in Denmark:



**Photo 1**

2C-I is chemically similar to 2C-B (regularly reported) but,

according to open source user reports, it has a slightly different effect. User reports refer to a delayed, deep and complex effect with 15-20 mg active substance. This may indicate a risk of overdose if sold as ecstasy, as occurs with PMA/PMMA.

Europol Drugs Unit kindly requests all law enforcement and forensic authorities to report details of seizures of tablets with this logo and/or active substance.

[Editor's Note: To contact the Europol Drugs Unit, email to: [info@europol.eu.int](mailto:info@europol.eu.int)]

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### **- INTELLIGENCE ALERT -**

#### **CANNABIS IN SUITCASE BOTTOMS/ COCAINE BRICKS WITH STAR/WAVE LOGOS IN THE CAYMAN ISLANDS**

The Cayman Islands Forensic Laboratory (Cayman Islands Hospital, Grand Cayman) has received a number of suitcases where cannabis packages were concealed in false bottoms (see Photos 2 and 3). The exhibits were all seized by Her Majesty's Customs Narcotics Enforcement Team as a result of luggage screening at the Grand Cayman Airport. Although the technique is not new, there was a sudden increase in this form of smuggling in 2002. In each case, the bottom had been packed tightly with cannabis parcels, some tailor-cut to specifically fill the spaces. In addition, the parcels were glued in place and covered in carbon paper. All the cases had an aromatic sweet smell (source not identified). Analysis by microscope and GC/MS confirmed cannabis. Total net masses of cannabis varied from approximately 8 to 25 kilograms per suitcase.



**Photo 2**



**Photo 3**

In addition, the Forensic Laboratory recently received two embossed powder bricks, suspected cocaine. The bricks were seized by the Royal Cayman Islands Police Drug Task Force in Grand Cayman. Each brick weighed about 1 kilogram, and was multiply wrapped in plastic, yellow latex, additional plastic, then grease, and finally in brown tape. The bricks themselves had an

unusual logo consisting of a wavy line with a five-pointed star above and to the right of the wave (see Photo 4). Analysis GC/MS, IR, and UV confirmed 84 percent cocaine hydrochloride. These were the first bricks of this logo type submitted to the laboratory.



**Photo 4**

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**- INTELLIGENCE ALERT -**

**MDMA TABLET WITH “MEDUSA” LOGO IN REDDING, CALIFORNIA**

The Bureau of Forensic Services Redding Regional Laboratory (Redding, California) recently received a submission of one tablet, suspected Ecstasy. The tablet was seized by the Redding Police Department. The submitted tablet was round with pink and white speckles and had a woman’s profile logo - commonly known as the “Medusa” logo (see Photo 5). Analysis by color tests and GC/MS confirmed MDMA (not quantitated). According to the website [www.dancesafe.org](http://www.dancesafe.org), Medusa logo tablets contain (relative percentages) both MDMA (4.8 percent) and caffeine (95.2 percent); however, the submitted tablet was not tested for caffeine. This is the first time that a Medusa logo tablet has been encountered by the Redding Laboratory.



**Photo 5**



**- INTELLIGENCE ALERT -**

**HOMEMADE CHOCOLATE CONTAINING PSILOCIN/PSILOCYBIN  
IN NORTH RIDGEFIELD, OHIO**

The Ohio Bureau of Criminal Identification and Investigation Laboratory (Richfield, Ohio) recently received eight pieces of homemade chocolate containing suspected psilocybin mushrooms (total net mass 145.76 grams; see Photo 6. Note that the four displayed pieces in the photo were split from one of the original eight pieces. The original pieces had shapes that suggested they were originally molded in an ice-cube tray) The exhibits were seized by the North Ridgeville Police Department, and were associated with an upcoming concert in the area. Inspection of each piece revealed the presence of vegetable matter (see photo), which was separated by particle-picking. Analysis of a methanol extract by TLC and GC/MS confirmed the presence of psilocin and psilocybin. This is the first submission of this type to this laboratory; however, a second submission containing over 150 similar homemade chocolate bars with suspected psilocin/psilocybin mushrooms was subsequently submitted; this latter seizure was made in Solon, Ohio and was also associated with the referenced concert.



**Photo 6**

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**- INTELLIGENCE ALERT -**

**UNUSUAL OPIUM SAMPLE IN PHOENIX, ARIZONA**

The Phoenix Police Department Laboratory Services Bureau (Phoenix, Arizona) recently received a rather unusual submission of suspected opium. The submission consisted of six plastic wrappers and one plastic vial, each containing a brown brittle substance having the smell of manure, total net mass 177 grams (for example, see Photo 7). The exhibits were seized by the Phoenix Police Department from a residence occupied by illegal immigrants from Honduras and Mexico. A Marquis-based field test of the substance was negative; however, the suspects admitted to grinding and snorting the material, so the investigating officer requested a complete laboratory analysis. A laboratory performed



**Photo 7**

Marquis-based screen gave a faint purple color (suggestive of an opiate). The sample was then dissolved/suspended in 0.2 N sulfuric acid, washed with chloroform, made basic with solid potassium carbonate, and then extracted with chloroform / isopropanol (4:1). A second Marquis test performed on the residue resulting from evaporation of the latter organic extract gave a bright purple color. Analysis of the extract by GC/MS confirmed codeine, morphine, papaverine, and noscapine (not quantitated). The adulterants were not identified, and it is unclear why the raw material gave a false negative with the Marquis, or why it had a smell resembling manure. This was the first opium sample received in recent history by the Phoenix Police Department Laboratory Services Bureau.

\* \* \* \* \*

### **- INTELLIGENCE ALERT -**

### **OPIUM POPPIES SOLD OVER THE INTERNET FROM CALIFORNIA**

The DEA Western Laboratory (San Francisco, California) recently received some unusual submissions of suspected opium poppies, including some that were artificially colored (see Photo 8). The poppies were purchased over the Internet by the DEA San Jose Regional Office (combined net mass of three purchases 6.899 kilograms). The dried poppies were being advertised as “floral decorations”. The purchases eventually led to the seizures of 3 boxes of dried poppies from a storage locker in Sacramento, and then an additional 42 boxes of dried poppies from a warehouse in Santa Paula (California). In



**Photo 8**

total, the combined seizures equaled about 25,500 pods, with a net mass of about 120.8 kilograms. The poppy pods were similar in shape but ranged in height from ½ to 2 inches. The poppies were bundled in sets of 15-20 smaller poppies, or 3-10 larger poppies, either wrapped with rubber bands or contained in plastic flower sleeves. Most of the poppies were a natural light brown color, but (as noted above) many were dyed in different colors, including purple, blue, orange, pink, and yellow. Analysis by GC/FID and GC/MS confirmed morphine and codeine. Quantitation of a typical pod indicated 1.72 milligrams of morphine, which extrapolates to about 44 grams of morphine for the entire seizure. This is the first opium poppy case of this size and origin to be submitted to the Western Laboratory, and the first poppy case of any type in several years.



**- INTELLIGENCE ALERT -**

**“HANDSHAKE” LOGO TABLETS CONTAINING *l*-METHAMPHETAMINE  
IN SPRINGFIELD, MISSOURI**

The DEA North Central Laboratory (Chicago, Illinois) recently received 50 blue tablets with a "handshake" logo on one side, suspected Ecstasy (see Photo 9). The tablets were purchased in Springfield, Missouri by investigators from the Springfield, Missouri Police Department and agents from the DEA St. Louis Division Mobile Enforcement Team. The tablets were round, flat-faced on both sides with the blank side having a slight beveled edge, 8.0 mm in diameter, and weighed 235 milligrams each. Analysis by GC (with and without chiral derivatization with (S)-(-)-N-trifluoroacetylprolyl chloride (TPC)), FTIR, and GC/MSD indicated a mixture of *l*-methamphetamine (16 mg/tablet calculated as the hydrochloride salt), 3,4- methylene-dioxymethamphetamine (55 mg/tablet calculated as the hydrochloride salt), and ketamine (16 mg/tablet calculated as the hydrochloride salt).



**Photo 10**

The Laboratory also received an unrelated but highly similar submission of 93 blue-gray "handshake" logo tablets, also round, flat-faced on both sides with the blank side having a slight beveled edge, 8.0 mm in diameter, and weighed 240 milligrams each, also suspected Ecstasy (see Photo 10). In this case, the tablets were purchased in St. Louis, Missouri by agents from the DEA St. Louis Division. Analysis in this case, however, indicated a mixture of *d,l*-methamphetamine (17 mg/tablet calculated as the hydrochloride salt), 3,4-methylenedioxy-methamphetamine (55 mg/tablet calculated as the hydrochloride salt), and ketamine (17 mg/tablet calculated as the hydrochloride salt) - virtually identical except for the enantiomeric composition of the methamphetamine.



**Photo 9**

[Editor's Notes: Although the "handshake" logo is a known source, and mixed MDMA/methamphetamine/ketamine "Ecstasy" tablets have also been previously encountered, the presence of *d,l*-methamphetamine and especially *l*-methamphetamine in such tablets are certainly unusual findings. According to the analyst in this case, the laboratory has encountered several subsequent submissions of similar tablets.]

**- INTELLIGENCE ALERT -**

**VERY LARGE PCP LABORATORY SEIZED IN BALTIMORE, MARYLAND**

The DEA Mid-Atlantic Laboratory (Largo, Maryland) recently assisted the DEA Baltimore District Office, Bureau of Alcohol, Tobacco, and Firearms (ATF), Maryland Department of the Environment, and the Baltimore City Police Department in taking down a very large-scale phencyclidine (PCP) manufacturing operation. Two locations were involved; the first was a residence in northwest Baltimore where the actual synthesis was being performed, while the second was a business in Jessup, Maryland which was being used to purchase large amounts (i.e., 55-gallon drums) of listed chemicals such as piperidine, phenylmagnesium bromide, and cyanide (Jessup is located about 15 miles south of Baltimore). The large quantities received by the business were subdivided into smaller units for use by the laboratory. The business, which was involved in manufacturing industrial cleaners, tried to justify the purchase of these chemicals by claiming that they were better ingredients for their cleaning products.

At the Baltimore residence, agents, officers, and chemists found forty-two 5-gallon buckets in the basement (see Photo 11). Thirty-nine contained various liquids, subsequently identified as benzene, phenylmagnesium bromide, and cyclohexanone; however, three contained a white powder that was presumptively identified as a cyanide salt (probably sodium or potassium, not formally determined). Other chemicals included three 50-pound bags of sodium metabisulfite, seven 800-mL bottles of phenylmagnesium bromide in ether, and thirteen empty 500-mL bottles that had contained piperidine (see Photo 12). A total of approximately 4.5 gallons of finished liquid PCP was identified, distributed between nine different beverage containers. In total, the identified chemicals indicated the use of the Maddox method of PCP synthesis. This combines the cyclohexanone, piperidine, cyanide salt, and sodium metabisulfite to form 1-piperidinocyclohexanecarbonitrile (PCC). The phenylmagnesium bromide solution is added to the PCC to form PCP. One bucket contained an ongoing reaction.

Analysis was conducted using GC, GC/MS and FTIR. The total amount of phencyclidine was calculated at 3.8 kilograms. The production capacity range was quite impressive. Based on the



**Photo 11**



**Photo 12**

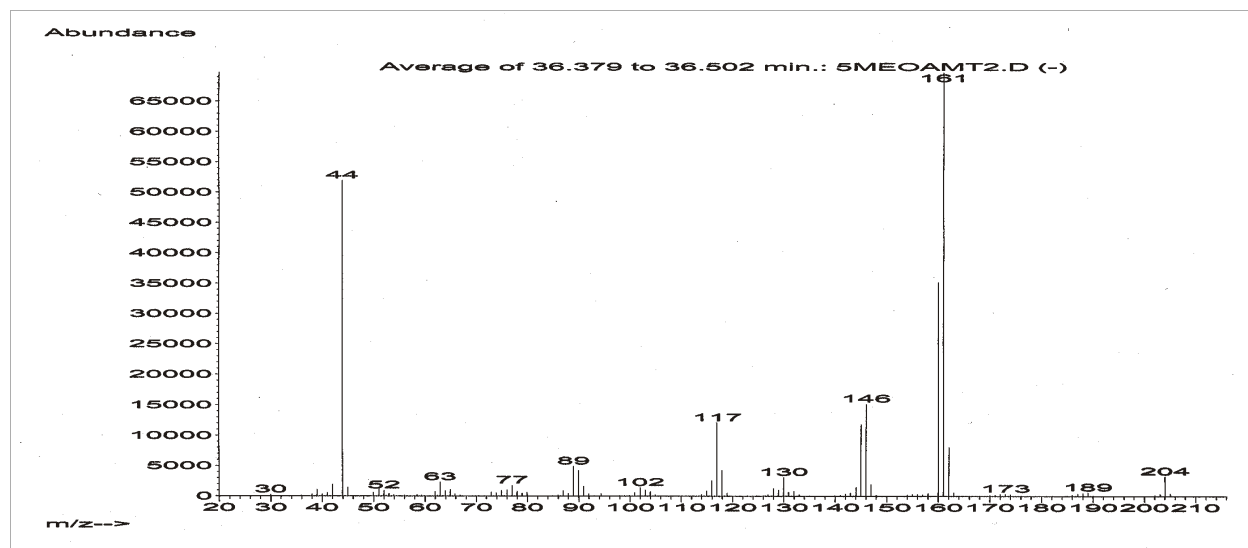
least abundant precursor, piperidine, the theoretical yield was calculated as 16 kilograms, whereas based on the most abundant precursor, cyclohexanone, the theoretical yield was 355.9 kilograms. Assuming a modest concentration of 75 mg/mL, this operation therefore could have produced anywhere from 56 to 1255 gallons of liquid PCP. Of note, a Baltimore City Police Officer present at the site commented that the largest previous seizure of liquid PCP in Baltimore was only one gallon.

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### - INTELLIGENCE ALERT -

#### **5-METHOXY-*ALPHA*-METHYLTRYPTAMINE (5-MEO-AMT) APPEARING IN SUGAR CUBES AND LSD-STYLE BLOTTER PAPERS**

The DEA Special Testing and Research Laboratory (Dulles, Virginia) has recently received multiple reports of sugar cubes and LSD-style blotter papers containing 5-methoxy-*alpha*-methyltryptamine (5-MeO-AMT). Drug abuse literature (unconfirmed) suggests that this tryptamine is relatively potent. The mass spectra of 5-MeO-AMT is provided below; complete analytical data will follow in a later issue of *Microgram Bulletin* or *Microgram Journal*.



Mass Spectra of 5-Methoxy-*alpha*-methyltryptamine (5-MeO-AMT).

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### - SCHEDULING UPDATE -

#### ***ALPHA*-METHYLTRYPTAMINE (AMT) AND 5-METHOXY-N,N-DIISOPROPYL- TRYPTAMINE (5-MeO-DIPT, "FOXY") ARE EMERGENCY SCHEDULED**

EVENT: Temporary placement of *alpha*-methyltryptamine (AMT) and 5-methoxy-N,N-diisopropyltryptamine (5-MeO-DIPT) into Schedule I through emergency scheduling provision

of the CSA

DATE OF EVENT: April 4, 2003

REPORTING ELEMENT: DEA Office of Diversion (OD)

WHEN REPORTED: April 8, 2003

SUMMARY: This is to provide you with an update on the Emergency scheduling of *alpha*-methyl-tryptamine (AMT) and 5-methoxy-N,N-diisopropyltryptamine (5-MeO-DIPT) into Schedule I of the CSA. AMT and 5-MeO-DIPT are tryptamine derivatives and share chemical and pharmacological similarities with the Schedule I tryptamine hallucinogens, *alpha*-ethyltryptamine (AET) and N,N-dimethyltryptamine (DMT), respectively. AMT and 5-MeO-DIPT are stimulant/hallucinogens abused for their abilities to induce hallucinatory states. AMT can produce nervous tension, irritability, restlessness, inability to sleep, blurry vision, pupillary dilatation, hallucinations and dextroamphetamine-like mood elevating effects. 5-MeO-DIPT can produce talkativeness, disinhibition, pupillary dilatation, nausea, jaw clenching, muscle tension and overt hallucinations with both auditory and visual distortions. There are no legitimate medical or scientific uses of AMT and 5-MeO-DIPT. The safety of human consumption of these substances has not been determined. Since 1999, law enforcement officials in several states have encountered AMT. The abuse by teens and young adults of AMT and 5-MeO-DIPT is an emerging problem. There have been reports of abuse of AMT and 5-MeO-DIPT at clubs and raves. Many tryptamine-based substances including AMT and 5-MeO-DIPT are illicitly available from United States and foreign chemical companies and from individuals through the Internet. There is also evidence suggesting the attempted clandestine production of AMT and 5-MeO-DIPT.

In response to this apparent growing problem and to avoid an imminent harm, a Final Notice temporarily placing AMT and 5-MeO-DIPT into Schedule I of the Controlled Substances Act (CSA) pursuant to the temporary scheduling provisions of the CSA was published in the Federal Register on April 4, 2003 (68 FR 16427). This adds to three other substances, namely N-benzylpiperazine (BZP), 1-(3-trifluoromethyl-phenyl) piperazine (TFMPP), and 2,5-dimethoxy-4-(n)-propylthiophenethylamine (2C-T-7), that were temporarily scheduled into Schedule I through a Final notice published in Federal Register on September 20, 2002 (67 FR 59161 and 67 FR 59163).

The Drug and Chemical Evaluation Section within the Office of Diversion Control is collecting information to support the final scheduling actions for these substances.

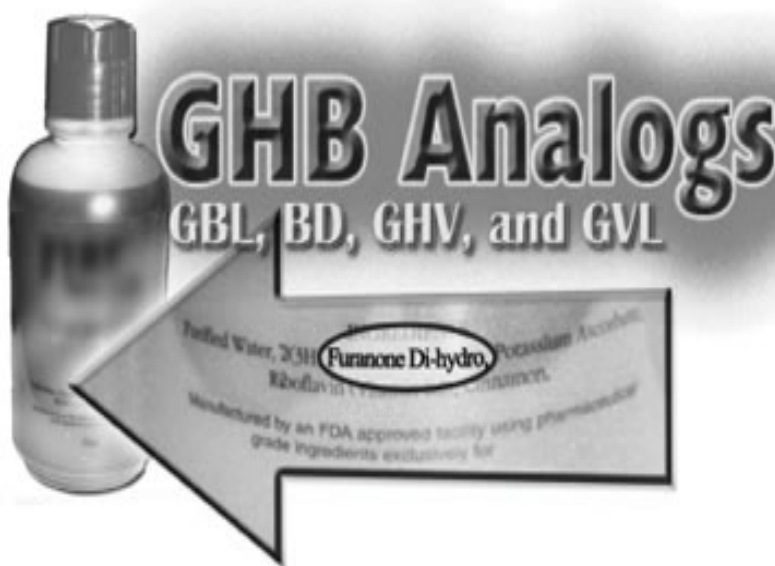
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## **Selected Intelligence Brief**

### **Information Bulletin: GHB Analogs. GBL, BD, GHV, and GVL.**

**National Drug Intelligence Center  
319 Washington St., 5<sup>th</sup> Floor  
Johnstown, PA 15901**

[Unclassified; Reprinted With Permission (Minus Four Case Vignettes)]



### **Introduction**

Because the criminal penalties associated with GHB (gamma-hydroxybutyrate) have been made more stringent and law enforcement pressure has rendered GHB more difficult to obtain, the distribution and abuse of GHB analogs have become an increasing concern. GHB analogs, which include GBL, BD, GHV, and GVL, are drugs that possess chemical structures that closely resemble GHB. The ingestion of any of these analogs produces physiological effects similar to the effects associated with GHB abuse--relaxation, mild euphoria, and drowsiness. Abusers who emerge from a deep sleep or coma caused by GHB analogs may become easily agitated and extremely combative. GHB analogs are of particular concern because they contribute to increasing numbers of auto accidents, sexual assaults, and deaths.

While federal law prohibits the sale of analogs for human consumption, GHB analogs are available legally as industrial solvents used to produce polyurethane, pesticides, elastic fibers, pharmaceuticals, coatings on metal or plastic, and other products. These analogs also are sold illicitly as supplements for bodybuilding, fat loss, reversal of baldness, improved eyesight, and to combat aging, depression, drug addiction, and insomnia. GBL and BD are sold as "fish tank cleaner," "ink stain remover," "ink cartridge cleaner," and "nail enamel remover" for approximately \$100 per bottle--much more expensive than

comparable products. Law enforcement's efforts to identify the abuse of GHB analogs are hampered by the fact that routine toxicological screens do not detect the presence of these analogs. In addition, distributors continually develop new analogs to avoid law enforcement detection.

## Analogs

GHB analogs often are abused in place of GHB or are used to produce GHB. Common GHB analogs include GBL, BD, GHV, and GVL. (See Table 1.) Both GBL and BD metabolize into GHB upon ingestion. GBL is the most common precursor used in the production of GHB. GVL is abused in place of GHB because it metabolizes into GHV, which produces physiological effects similar to GHB.

**Table 1. GHB Analogs**

Analogue	Chemical Name/Alternative Name	Precursor for Production of	Metabolizes Into
GBL	gamma-butyrolactone furonone di-hydro dihydrofuranone	GHB	GHB
BD	1,4-butanediol tetramethylene glycol sucol-B butylene glycol	GBL	GHB
GHV	gamma-hydroxyvalerate methyl-GHB	0	*
GVL	gamma-valerolactone 4-pentanolide	GHV	GHV

\*GHV is not used as a precursor and is not metabolized into another drug.

## Abuse

GHB analogs are distributed as liquids and consumed orally. When ingested, these analogs produce effects such as relaxation, mild euphoria, and drowsiness. Such effects are similar to those associated with GHB abuse and may resemble the results of alcohol intoxication. GHB analogs also may increase libido, suggestibility, passivity, and cause amnesia--traits that make users vulnerable to sexual assault and other criminal acts. Users awakening or emerging from coma may exhibit extreme combativeness, a condition which is also observed among those in withdrawal from addiction to GHB and its analogs. GHB analogs are known to produce side effects such as topical irritation to the skin and eyes, nausea,



vomiting, incontinence, loss of consciousness, seizures, liver damage, kidney failure, respiratory depression, and even death. GHB analogs are physically addictive, causing addicts to experience severe withdrawal symptoms if they miss a dose or attempt to stop using the drug.

Some GHB analog abusers begin consuming dietary supplements believing the claims made by manufacturers, and then find themselves addicted to the product. GHB analogs typically are abused in place of GHB by users who want to experience the effects associated with GHB and who find the analogs more widely available or easily obtained. Often users are unaware that they are consuming an analog and mistakenly believe that the substance they are ingesting is GHB. Many users mix the analogs with flavored beverages to mitigate their salty flavor and unappealing odor. Some users, however, simply ingest the drugs straight or mixed with water. It is often difficult or impossible to detect the presence of GBL, BD, GHV, or GVL when they are mixed with other liquids because these analogs are all clear and colorless. A quick test that indicates the possible presence of GHB analogs or GHB in a clear liquid involves shaking the liquid. If it becomes cloudy, GHB analogs or GHB may be present.

Because GHB analogs either are metabolized into GHB by the human body or produce similar physiological effects when ingested, healthcare providers often are unable to distinguish between the abuse of GHB and GHB analogs. Thus, the rising abuse of GHB, evidenced by the increase in Drug Abuse Warning Network (DAWN) emergency department mentions, reflects increased GHB analog use as well. (See Table 2.)

**Table 2. Emergency Department Mentions for GHB and GBL  
in 22 Major U.S. Cities, 1994 - 2000.**

Year	Total
1994	56
1995	145
1996	638
1997	762
1998	1,282
1999	3,178
2000	4,969

Source: Substance Abuse and Mental Health Services Administration, Drug Abuse Warning Network.

## **Distribution**

GHB analogs are readily available, and various methods are used to distribute these drugs. Because of legislation (see Legislation section), GHB analogs are legally available only in products not intended for human consumption. Abusers and distributors may obtain commercial products such as chemical solvents legally and then illegally consume or distribute them. Illegal distribution of GHB analogs often occurs at raves, concerts, nightclubs, health clubs, gyms, and on college campuses. At these venues GHB analogs usually are sold for \$10 to \$20 per capful (approximately 1 teaspoonful). When distributors sell these drugs, they may fail to specify which analog they are selling, or they may misrepresent the analog as GHB.

GHB analogs also are distributed at disreputable stores that sell health food and nutritional supplements. The analogs also may be marketed on the Internet and then shipped to purchasers via package delivery services. Typically, analogs are marketed as dietary supplements, sleep aids, and cleaning products. They are packaged in bottles containing 4 to 20 ounces and sold for \$40 to \$100 each. The products that are distributed as dietary supplements usually contain GVL as the active ingredient, while the cleaning supplies usually contain GBL or BD. The concentration of the analog varies; therefore, the size of a dose may range from one-half teaspoon to one-half ounce, and the number of doses per bottle may range from 24 to 48.

Individuals who illegally produce GHB analogs for human consumption often list alternative chemical names to disguise the ingredients. Most users recognize the analog by the brand name or through advertisements that tout the product as a replacement for a similar product that has been removed from the market. Products that contained BD or GBL such as RenewTrient II, Serenity, Inner-G, Soma Solution, and Blue Nitro are no longer sold, primarily because of law enforcement pressure, but comparable products with similar brand names are available.

GHB analogs often are sold with disclaimers that they are not for human consumption; however, many of the products have labels implying that the product may be ingested. One product marketed as an industrial solvent has a label that states "Warning! Accidental ingestion of [product] will produce GHB in your body. If you ingest some by mistake, don't take alcohol or any other drug!" Another product label states "Warning: Accidental ingestion may cause...euphoria...increases tactile sensitivity...". Many of the products are marketed as "Great Household Bargains" (GHB) in order to increase their exposure to individuals seeking GHB analogs.

In addition to the distribution methods discussed previously, supplies, kits, and recipes for producing GHB using the GHB analog GBL are marketed and sold on the Internet.

## **Tests for GHB Analogs**

Seized GHB analogs frequently are not identified because detection of such analogs requires specific field and laboratory testing. Three different color tests--cobalt nitrate, Marquis reagent, and Mandelin reagent--are useful for detecting the presence of GHB analogs. (Contact forensic laboratories to obtain specific instructions regarding utilizing these test kits.) Both the Marquis reagent and the Mandelin reagent tests are available commercially.

Routine toxicological screens do not detect GHB or GHB analogs; thus, law enforcement officers and medical personnel must order specific blood and urine tests when they suspect GHB analog abuse. The most common urine tests screen only for the "NIDA-5," five of the most commonly abused categories of

drugs--amphetamines (amphetamines, methamphetamine), cocaine (powdered cocaine, crack), cannabinoids (marijuana, hash), opiates (heroin, opium, codeine, morphine), and phencyclidine (PCP). GHB in the blood or urine can result from the ingestion of GHB, GBL, or BD. To yield a reliable result, tests for GHB and GHB analogs must be performed not long after ingestion. Urine tests for GHB and GHB analogs must be performed within 12 hours after ingestion, and blood tests must be performed within 5 hours.

Federal, state, and local forensic laboratories may not routinely test for GHB in blood or urine. For example, the Florida Department of Law Enforcement (FDLE) began testing for GHB in urine on December 1, 2000, but tests are performed only if the suspect exhibits symptoms indicating the presence of GHB. FDLE does not have the resources to conduct blood tests; if blood tests are needed, the samples to be tested must be sent to outside laboratories--some of which are located in other states.

Because GHB analogs produce effects similar to GHB, driving under the influence of the analogs is just as dangerous as driving under the influence of GHB. As a result, some agencies have adopted aggressive strategies for identifying drivers who may have consumed GHB. The Pinellas-Pasco Medical Examiner's Office in Florida conducts GHB tests on drivers who are suspected of driving under the influence (DUI). In 2000 GHB was detected in approximately 8 percent of the suspected DUI cases that the office examined.

## Legislation

On February 18, 2000, the "Hillory J. Farias and Samantha Reid Date-Rape Prohibition Act of 1999" (Public Law 106-172) was signed into law, legislating GHB as a Schedule I controlled substance. GBL was also regulated under this law as a List I controlled chemical. Illicit use of GHB analogs may now be prosecuted as Schedule I substances under 21 U.S. Code § 813.

GHB analogs are treated as controlled substances under Federal law only if intended for human consumption. According to 21 U.S.C. § 813, "a controlled substance analog(ue) shall, to the extent intended for human consumption, be treated, for the purposes of any Federal law as a controlled substance in Schedule I." Thus, authorities can prosecute drug offenses involving GHB analogs in the same manner as offenses involving GHB. (See 21 U.S.C. § 802(32) for the definition of a controlled substance analog(ue).)

## Outlook

Deterring the distribution and abuse of GHB analogs poses unique challenges. Some analogs have legitimate purposes and are legally available. Distributors of illicit GHB analogs will continue to develop new products to disguise their activities, and illicit producers will continue to develop new GHB analogs for the same reasons. Web sites advertising these products will continue to be deceptive and ever-changing. Distributors will develop new disguises for GHB analogs in addition to marketing them as cleaning fluids and dietary supplements. Sharing current information and associated trends relating to GHB analogs among medical personnel, law enforcement officers, and laboratory personnel is essential to stemming the distribution and abuse of these analogs.

\* \* \* \* \*

## SELECTED REFERENCES

[Note: Selected references are a compilation of recent publications of presumed interest to forensic chemists. Unless otherwise stated, all listed citations are published in English. If available, the email address for the primary author is provided as the contact information. Listed mailing address information (which is sometimes cryptic or incomplete) exactly duplicates that listed by the abstracting services.]

1. Piette V, Parmentier F. **Analysis of illicit amphetamine seizures by capillary zone electrophoresis.** J Chromatogr A 2002;979:345. [Editor's Notes: Presents a CZE methodology for analysis of typical drugs found in Ecstasy tablets. Contact: Laboratory of Drug Analysis, Scientific Institute of Public Health - Louis Pasteur, Rue Juliette Wytsman 14, B-1050 Brussels, Belgium.]
2. Briellmann TA, Dussy FE, Bovens MG. **Forensic analysis of heroin and cocaine seizures.** Chimia 2002;56:74. [Editor's Notes: Presents a survey and overview of seizures in Switzerland (date range not specified in abstract). Contact: Institute of Forensic Medicine, Pestalozzistrasse 22, CH-4004 Basel, Switzerland.]
3. Tishmack PA, Bugay DE, Byrn SR. **Solid-state nuclear magnetic resonance spectroscopy - pharmaceutical applications.** Journal of Pharmaceutical Sciences 2003;92(3):441. [Editor's Notes: A mini-review of the title topic, focusing on solid pharmaceutical drug formulations. Contact: [dbugay@ssci-inc.com](mailto:dbugay@ssci-inc.com)]
4. Kelly SA, Glynn PM, Madden SJ, Grayson DH. **Impurities in a morphine sulfate drug product identified as 5-(hydroxymethyl)-2-fufural, 10-hydroxymorphine and 10-oxomorphine.** Journal of Pharmaceutical Sciences 2003;92(3):485. [Editor's Notes: The referenced impurities were isolated by semi-prep HPLC and identified via MS and NMR. The presence of sugars in the drug formulation was implicated in the formation of the impurities. Contact: [sean\\_kelly2@merck.com](mailto:sean_kelly2@merck.com)]
5. DeBoer D, Goemans WPJ, Ghezavat VR, vanOoijen RD, Maes RAA. **Seizure of illicitly produced para-fluorofentanyl: Quantitative analysis of the content of capsules and tablets.** Journal of Pharmaceutical and Biomedical Analysis 2003;31(3):557. [Editor's Notes: Presents a GC/MS methodology for the title analysis; HPLC/UV was also used to quantify caffeine being used as an adulterant. The samples derived from an illicit laboratory in the Netherlands. Contact: D deBoer, Inst Nacl Desporto, Lab Anal Dopagem & Bioquim, Av Prof, P-1600190 Lisbon, Portugal.]
6. Khalil S, Kelzieh A. **New polyvinyl chloride membrane electrode without inner reference solution for the determination of methadone.** Journal of Pharmaceutical and Biomedical Analysis 2003;31(3):601. [Editor's Notes: Presents a direct potentiometric method for analyzing methadone in pharmaceutical preparations. Contact: S Khalil, Techers Coll Riyadh, Dept Chem, POB 4341, Riyadh 11491, Saudi Arabia.]
7. Sun GX, Wang Y, Sun YQ. **The quantitative determinations of glycyrrhizic acid, glycyrrhetic acid, morphine, and sodium benzoate in compound liquorice tablets by HPCE.** Journal of Liquid Chromatography & Related Technologies 2003;26(1):43. [Editor's Notes: Presents a CZE/UV method to perform the title analysis. Contact: Sun GX, Shenyang Pharmaceut Univ, 103 Wenhua Rd, Shenhe Dist, Shenyang 110016, Peoples R China.]

8. Jarikote DV, Siddiqui SA, Rajagopal R, Daniel T, Lahoti RJ, Srinivasan KV. **Room temperature ionic liquid promoted synthesis of 1,5-benzodiazepine derivatives under ambient conditions.** Tetrahedron Letters 2003;44(9):1835. [Editor's Notes: Presents a novel synthetic approach to the title compounds. Contact: Srinivasan KV, Natl Chem Lab, Div Organ Chem Technol, Dr Homi Bhabha Rd, Pune 411008, Maharashtra, India.]
9. Qi ML, Wang P, Zhou L, Gu JL, Fu RN. **Simultaneous determination of acetaminophen, detromethorphen [sic] and pseudoephedrine hydrochloride in a new drug formulation for cold treatment by HPLC.** Chromatographia 2003;57(3-4):139. [Editor's Notes: Presents a validated method for the referenced analysis, which is completed in less than 10 minutes per run. Contact: Qi ML, Beijing Inst Technol, Sch Chem Engn & Mat Sci, Dept Chem, Beijing 100081, Peoples R. China.]
10. Gelfman DE, Teder O. **Method and apparatus for detection of illegal substances in commerce.** U.S. Pat. Appl. Publ. US 2003 33,851 (Cl. 73-19.01; G01N7/00), 20 Feb 2003, Appl. 927,895, 10 Aug 2001. [Editor's Notes: Presents a device for collecting and analyzing particulates of drugs, explosives, and toxic materials. The analytical basis is not specified. Contact: No address information was provided.]

#### **Additional References of Possible Interest:**

1. Robertson MD, Marinetti LJ. **Carisoprodol - Effects on Human Performance and Behavior.** Forensic Science Review 2003;15(1):1. [Editor's Notes: A minor review of the title compound, focusing on impaired driving performance. Contact: Independent Forensic Consulting, Beaumaris, Victoria, Australia.]
2. Logan BK, Couper FJ. **3,4-Methylenedioxymethamphetamine - Effects on human performance and behavior.** Forensic Science Review 2003;15(1):11. [Editor's Notes: A minor review of the title compound, focusing on impaired driving performance. Contact: Forensic Laboratory Services Bureau, Washington State Patrol, Seattle, Washington (zip code not provided in the abstract).]
3. Stout PR, Farrell LJ. **Opioids - Effects on Human Performance and Behavior.** Forensic Science Review 2003;15(1):29. [Editor's Notes: A minor review of the title compound, focusing on impaired driving performance. Contact: Navy Drug Screening Laboratory, Naval Air Station Jacksonville, Jacksonville, Florida (zip code not provided in the abstract).]
4. Mozayani A. **Phencyclidine - Effects on human performance and behavior.** Forensic Science Review 2003;15(1):61. [Editor's Notes: A general review of PCP, including information on its detection, identification, and analysis. Contact: Harris County Medical Examiner's Office, Houston, Texas (zip code not provided in abstract).]
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6. Przybyl AK, FlippenAnderson JL, Jacobsen AE, Rice KC. **Practical and high-yield syntheses of dihydromorphine from tetrahydrothebaine and efficient syntheses of (8S)-8-bromomorphide.** Journal of Organic Chemistry 2003;68(5):2010. [Editor's Notes:

- Dihydromorphine is prepared in 92% yield. Contact: Rice KC, NIDDKD, Med Chem Lab, NIH, Bldg 8, Room B1-22, 8 Ctr Dr, MSC 0815, Bethesda, MD 20892.]
7. Zagnoni PG, Albano C. **Psychostimulants and Epilepsy.** *Epilepsia* 2002;43(Supp. 2):28. [Editor's Notes: A minor review of the correlation between seizures and illicit drug use. Contact: Unita Operativa di Neurologia, ASL 15 Cuneo, Italy.]
  8. Da Matta Chasin AA, De Carvalho DG, Pedrozo MDFM, De Souza MC, Sanson LN. **Occurrence of lidocaine in samples of crack/cocaine seizures in the metropolitan region of Sao Paulo and in biological fluids analysed in the Forensic Toxicology Laboratory, Medical Legal Institute (IML) in Sao Paulo from January to June of 2000.** *Bull TIAFT* 2003;33(1):7. [Editor's Notes: Includes analysis data from seized drugs; however, primary focus is analysis of biological fluids. Contact: IML, Medical Legal Institute, Sao Paulo, Brazil.]
  9. Song YR, Wang DF, Hu YP, Chen XX, Jiao YG, Hou DY. **Direct separation and quantitative determination of clenbuterol enantiomers by high performance liquid chromatography using an amide type chiral stationary phase.** *Journal of Pharmaceutical and Biomedical Analysis* 2003;31(2):311. [Editor's Notes: Focus is on profiling clenbuterol enantiomers in human serum. Contact: Song YR, Beijing Normal Univ, Dept Chem, Beijing 100875, Peoples R China.]
  10. Myers S. **Forensic science.** *Nature* 2003;421(6925):872. [Editor's Notes: Presents a minor overview of the development of forensic DNA laboratories; includes some general comments of interest on the "real-life value" of forensic laboratories. Contact: No address information was provided.]
  11. Petersen JR, Ohorodudu AO, Mohammad A, Payne DA. **Capillary Electrophoresis and its application in the clinical laboratory.** *Clinica Chimica Acta* 2003;330(1-2):1. [Editor's Notes: Presents an overview of CE use and potential in clinical laboratories, comparing and contrasting to traditional electrophoretic and HPLC methods. Contact: Department of Pathology, University of Texas Medical Branch, Galveston, TX (zip code not provided).]
  12. Matsumoto T, Sano T, Matsuoka T, Aoki M, Maeno Y, Nagao M. **Case Report: Simultaneous determination of carisoprodol and acetaminophen in an attempted suicide by liquid chromatography - mass spectrometry with positive electrospray ionization.** *Journal of Analytical Toxicology* 2003;27(2):118. [Editor's Notes: Presents the analysis of carisoprodol, meprobamate, and acetaminophen by LC/MS. The focus is biological testing of urine and plasma. Contact: Aichi Prefectural Police Hdqrs., Criminal Investigation Laboratory, 1-1 Sannomaru 2-chome, Naka-ku, Nagoya 460-8502, Japan.]
  13. Li J. **Determination of cocaine and its metabolites.** *Zhongguo Yaowu Yilaixing Zazhi* 2002;11(2):90. [Editor's Notes: A review on the detection of cocaine and its metabolites. This article is written in Chinese. Contact: Normal College of Vocational Technology, Peking United University, Beijing 100011, Peop. Rep. China.]
  14. Cordani P. **Self defense test strip package for drug testing in food and drinks.** *U.S. Pat. Appl. Publ. US* 2003 26,731 (Cl. 422-58;G01N31/22), 6 Feb 2003, Appl. 923,507, 6 Aug 2001. [Editor's Notes: Discusses a test-strip in the shape of a drinking straw or stirrer for discreetly determining the presence of (undeclared) drugs (presumably date-rape drugs). Contact: No address information was provided.]



15. Brennan J, Dillon P, OKennedy R. **Production, purification and characterisation of genetically derived scFv and bifunctional antibody fragments capable of detecting illicit drug residues.** Journal of Chromatography B - Analytical Technologies in the Biomedical and Life Sciences 2003;786(1-2):327. [Editor's Notes: The referenced antibodies were created to detect morphine, and were applied to saliva. Contact: J Brennan, Dublin City Univ, Sch Biotechnol, Appl Biochem Grp, Dublin 9, Ireland.]
16. Mancinelli R, Guiucci MS. **Procedural and interpretative problems in the determination of drugs of abuse.** Annali dell'Istituto Superiore di Sanita 2002;38(3):305. [Editor's Notes: Presents an overview of the state of the art of analytical toxicology. This article is written in Italian. Contact: Laboratorio di Biochimica Clinica, Istituto Superiore di Sanita, Rome, Italy.]

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## EMPLOYMENT OPPORTUNITIES

### 1. Johnson County Sheriff's Office Criminalistics Laboratory (2 Positions)

(Third and Final  
Posting)

**Position 1:** DNA Technical Leader/ Forensic Chemist

**Location:** Mission, Kansas (Kansas City metropolitan area)

**Salary:** \$50,564.80 to \$72,280.00 per year

**Application Deadline:** Open Until Filled

**Duties:** This position will serve as the laboratory's DNA Technical Leader and section coordinator. The major duties of this position include overseeing the technical operations of the Biology Section to ensure compliance with the American Society of Crime Laboratory Directors/Laboratory Accreditation Board Standards (ASCLD/LAB) as well as the Quality Assurance Standards for Forensic DNA Testing Laboratories standards. In addition, this position will have some casework responsibility; including evaluating the nature, origin and significance of physical evidence both in the laboratory and at crime scenes; performing physical, chemical, biochemical and genetic analysis of biological material associated with evidence using DNA analysis methods; maintaining laboratory records, preparing written technical reports of analysis, and providing effective expert testimony in courts of law. This position will oversee the training of laboratory examiners and the evaluation and implementation of new scientific techniques for the DNA section of the laboratory. The successful applicant will also be a commissioned Deputy Sheriff.

**General Requirements:** Candidates must meet the educational and experience requirements for a DNA Technical Leader as published in Section 5.2 of the Quality Assurance Standards for Forensic DNA Testing Laboratories (U.S. Department of Justice, Federal Bureau of Investigation, 07/15/98). These guidelines are available on-line at:

<http://www.cstl.nist.gov/biotech/strbase/dabqas.htm> Candidates without a Master's degree must already possess a waiver of the degree requirements as provided in section 5.2.1.1 of the above standards. The successful candidate must also meet the minimum qualifications of a Deputy Sheriff.

The applicant will be required to successfully complete the Kansas Law Enforcement Training Center curriculum. Also, the applicant will be required to successfully complete a laboratory training program in biology and a qualifying test before beginning independent casework responsibilities.

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**Position 2:** Firearms and Tool Mark Examiner

**Location:** Mission, Kansas (Kansas City metropolitan area)

**Salary:** \$50,564.80 to \$72,280.00 per year

**Application Deadline:** Open Until Filled

**Duties:** The major duties include examining firearms for function; comparison with bullets and cartridge cases; serial number restoration; GSR examination of clothing associated with firearm cases; and tool mark examinations. Other duties may be assigned based upon the qualifications of the successful applicant. The successful applicant will become a commissioned Deputy Sheriff and will be required to complete the Kansas Law Enforcement Training Center curriculum. Also, the successful applicant will be required to successfully complete a qualifying test before beginning independent casework responsibilities.

**General Requirements:** A minimum of three years of experience in firearm and tool mark examination. Experience must include the completion of a two-year, full-time training program under the direction of an experienced firearms and tool mark examiner. In addition, the successful candidate must have a least one-year of experience doing independent casework examination and being qualified as an expert witness in a court of law in the area of firearms and tool mark examination. Experience with the National Integrated Ballistic Information Network (NIBIN) and familiarity with the Association of Firearms and Tool Mark Examiners' (AFTE) Guidelines and the American Society of Crime Laboratory Directors/Laboratory Accreditation Board's (ASCLD/LAB) Standards is desired. Applicants must also meet the minimum qualifications of a Deputy Sheriff.

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**Application Procedures for both Positions:** Applications can be obtained by contacting the Sheriff's Department Personnel Division at the following address.

Johnson County Sheriff's Department, Personnel and Training, 125 N. Cherry, Olathe, KS 66061; Phone: (913) 791-5511 (or Toll Free at: (866) 262-3744)

Additional Information about this position can be obtained from Director L. Keith Kerr at the Crime Laboratory by calling: (913) 826-3209.

The Johnson County Sheriff's Department does not discriminate on the basis of race, color, national origin, sex, religion, age, or disabled status in employment or the provision of programs and services.

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## SCIENTIFIC MEETINGS

1. **Title:** Mid-Atlantic Association of Forensic Sciences (MAAFS) Annual Meeting (Second and Final Posting)  
**Sponsoring Organization:** Mid-Atlantic Association of Forensic Sciences  
**Inclusive Dates:** May 5 - 9, 2003  
**Location:** Annapolis, MD (Sheraton Barcelo)  
**Meeting Registration Procedure, Deadline, and Costs:** [See website]  
**Recommended Lodging (Registration Deadline and Costs):** [See website]  
**Contact Individual's Name, Phone Number, and email Address:** [See website]  
**Website:** [[www.maafs.org/annualmeeting.htm](http://www.maafs.org/annualmeeting.htm)]

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2. **Title:** Annual New England Seminar in Forensic Sciences (Second Posting)  
**Sponsoring Organization:** Colby College, Special Programs  
**Inclusive Dates:** August 10 - 14, 2003  
**Location:** Colby College, Waterville, ME  
**Meeting Registration Procedure, Deadline, and Costs:** [See website]  
**Recommended Lodging (Registration Deadline and Costs):** [See website]  
**Contact Individual's Name, Phone Number, and email Address:** Jesse Davis, 207/872-3386 (FAX -3383),  
[summer@colby.edu](mailto:summer@colby.edu)  
**Website:** [[www.colby.edu/spec.prog/cme.html](http://www.colby.edu/spec.prog/cme.html)]

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3. **Title:** 29th Annual Meeting of the Northeastern Association of Forensic Scientists (First Bimonthly Posting)  
**Sponsoring Organization:** Northeastern Association of Forensic Scientists  
**Inclusive Dates:** November 5 - 8, 2003  
**Location:** Crowne Plaza Hotel, Pittsfield, MA  
**Meeting Registration Procedure, Deadline, and Costs:** [Not Provided]  
**Recommended Lodging (Registration Deadline and Costs):** [Not Provided]  
**Contact Individual's Name, Phone Number, and email Address:** Jennifer F. Limoges, 518/457-0054 (FAX 485-8502),  
[jlimoges@troopers.state.ny.us](mailto:jlimoges@troopers.state.ny.us)  
**Website:** [Not Provided]

4. **Title: SWAFS 2003 Training Conference**

(First Bimonthly Posting)

**Sponsoring Organization:** Southwestern Association of Forensic Scientists

**Inclusive Dates:** November 3 - 6, 2003

**Location:** Radisson Plaza Hotel, Fort Worth, TX

**Meeting Registration Procedure, Deadline, and Costs:** [Not Provided]

**Recommended Lodging (Registration Deadline and Costs):** [see: [www.radisson.com/ftworthtx](http://www.radisson.com/ftworthtx) 800/333-3333]

**Contact Individual's Name, Phone Number, and email Address:** Michelle O'Neal, 817/920-5700, x163,

[fortworth2003@swafs.org](mailto:fortworth2003@swafs.org)

**Website:** [www.swafs.org](http://www.swafs.org)

\* \* \* \* \*

## THE DEA FY - 2003 STATE AND LOCAL FORENSIC CHEMISTS SEMINAR SCHEDULE

The remainder of the FY - 2003 schedule for the DEA's State and Local Forensic Chemists Seminar is as follows:

June 9 – 13, 2003

September 15 – 19, 2003

Note that the school is open only to forensic chemists working for law enforcement agencies, and is intended for chemists who have completed their agency's internal training program and have also been working on the bench for at least one year. There is no tuition charge for this course. The course is held in Northern Virginia, near the Washington/Dulles International Airport. For additional information, eligibility requirements, or to enroll, see the September 2002 issue of *Microgram Bulletin*, or call 703 668-3337.

\* \* \* \* \*

## Computer Corner

Technical and Administrative Reviews

## #170

by Michael J. Phelan  
DEA Special Testing  
and Research Laboratory

One of the essential elements of a digital evidence laboratory quality assurance program is a thorough review of the draft reports of examination. The review process should utilize a check and balance philosophy to ensure that the final reports are both technically sound and administratively consistent with laboratory policies. Digital evidence examination reports are often quite complex because the

findings are usually both numerous and varied. Reports typically include a mixture of statements of fact and examiner opinions.

DEA's review process operates on two different levels. A Group Supervisor or senior examiner performs the first level (technical) review, while the Laboratory Director usually conducts the second level

(administrative) review. The technical review covers seven reporting areas, as follows:

### Report Identification

First, the descriptive identification information is checked. Case numbers, exhibit numbers, laboratory numbers, file title, and report distribution are compared to the original documentation and verified.

### **Case Examination File**

Second, the case examination folder is reviewed to ensure completion of all appropriate internal laboratory forms. DEA's Digital Evidence Laboratory makes extensive use of "check the box" or "fill in the blank" forms to ensure that the evidence is adequately characterized for both identification and examination purposes. A typical examination first requires a form describing all objects to be examined. A second form that describes the computer, its peripherals, and pertinent hardware or firmware information (including CMOS clock setting and hard drive geometry information) is checked. A third form that focuses on the hard drive(s), detailing the number of hard drives, storage capacity, partition numbers, and file structures is reviewed. A fourth and final form that details all of the parameter settings used by the examiner to acquire a copy of the original evidence is also checked.

### **Chain of Custody**

The third reporting area covers the chain of custody, which is reviewed by comparing the submitted evidentiary paperwork to the report narrative. Appropriate signature completion blocks are reviewed on the incoming chain of custody document. Computer make, model, and serial number documentation, along with hard drive make, model, and serial number are verified. Other incoming evidence documentation, such as United States Postal Service registered mail or Federal Express shipping numbers, and counts of objects submitted for examination, are also reviewed. Most of this information is recorded on the

internal laboratory forms as well as in the report of examination narrative. All of this information must be accurately recorded.

This information is very important, because a typical chain of custody suppression motion will most likely focus on any discrepancies in this area. [This is because it is the least technical and therefore one of the best understood aspects of evidence handling and analysis by defense attorneys.]

### **Report Organization**

Fourth, the report is reviewed for general content. At DEA, this consists of an inspection of the organizational format and standard findings paragraph. DEA's organizational review consists of a simple check of layout format to insure that all findings paragraphs are numbered in accordance with DEA laboratory policy, and also that the report synopsis is concise and to the point. The standard findings paragraphs can be extensive, and will reflect individual laboratory examination protocols. DEA's standard findings paragraphs usually consist of the following: 1) A statement documenting the duplication of the original evidence to make a working copy, and the recording of an archive copy onto a tape; 2) A statement documenting a computer virus scan (and the results); 3) An enumeration of the key word search terms; 4) A listing of all file names, with associated date and time stamp information; and 5) The documenting of the sealing of the archive backup tape in a numbered DEA heat seal evidence envelope.

### **Findings Assessed**

Fifth, the case specific findings detailed in the body of the report of examination are reviewed. Typically, findings are stored on a CD in a format that is easily accessed by the Case Agent. The report of examination should clearly identify where the finding of interest (such as a file or file fragment) was found on the original evidence (directory and file name, or hard drive sector). Additionally, the location of the file copy of the finding on the report's accompanying CD needs to be documented. Occasionally, findings are printed onto paper, and initialed and dated by the examiner. The findings should be organized into simple paragraphs to simplify reader understanding and focus. A one-sentence summary of each finding is included in the report, to indicate to the reader what kind of information has been recovered and included on the CD. This synthesizing process facilitates the rapid review of the material by the Case Agent. For example, financial information belonging to the XYZ business, or e-mail belonging to [badguy@domain.com](mailto:badguy@domain.com) was found in the "My Documents" folder, and was copied to the "My Documents" folder on the findings CD. Findings must also be documented in the examination notes. A technical review of the findings should assess the wording used by the examiner. Technical jargon such as free space, slack area, and carve, if needed, should be kept to a minimum and explained in layman's terms when possible.

### **CD Check**

Sixth, a CD containing the findings must be checked to ensure that the findings (files or file fragments) referenced in the

report of examination are all present and can all be opened. It is important that every file cited in the report of examination be precisely named as stated in the report, and located exactly where the report states it to be. Also, the CD containing the findings must be appropriately labeled, initialed, and dated by the examiner. The CD is the equivalent of a paper attachment.

### **Methodology Review**

Seventh, the examination checklist needs to be reviewed. Have the broad examination milestones such as file browsing, keyword searching and file execution tasks been completed? Findings and conclusions must be consistent with the methodology and software tools utilized. Both the base examination software (such as Encase, Ilook, or Forensic Tool Kit) and any specialty examination software (such as e-mail reader software or data carving software) need to be documented.

### **Administrative Review**

A second individual, usually the Laboratory Director, conducts the administrative review. The administrative review spot checks the previously described technical review areas, and also looks at the overall scope of examination to determine if the level of effort was commensurate with the type and seriousness of the case. Administrative reviews also critically assess the language used in the report, to ensure that all assertions and conclusions are supportable and can be easily understood by non-technical personnel.

This two-tier review process is an excellent method of ensuring both quality control and

uniformity of effort within the laboratory. Reviews are time consuming, averaging 30-45 minutes per report.

A third tier can be added to the process by establishing a quarterly peer review committee to further check the work of the technical and administrative reviewers. The use of peer review committee is a well recognized quality assurance technique in most forensic laboratories, and is highly recommended.

### **Typical Problems Detected**

The typical types of problems that are detected in the review process fall into two categories. New examiners often have problems with their writing styles, i.e.; their reports are too technical and/or contain unnecessary, overstated, or unsupported statements. More senior examiner personnel occasionally become lackadaisical or complacent, and the examination note quality or details in their report writing become deficient. The findings CD may not be thoroughly checked, or files may not be accessible or properly labeled. DEA has found the dual review process invaluable in producing a reliable product on a consistent basis.

Questions or comments?

E-mail: [mphelan@erols.com](mailto:mphelan@erols.com)



# Microgram

## *Bulletin*

**Published by:**

**The Drug Enforcement Administration  
Office of Forensic Sciences  
Washington, DC 20537**

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**VOL. XXXVI, NO. 6**

**JUNE 2003**

**- INTELLIGENCE ALERT -**

**“HOMEMADE” CHOCOLATES CONTAINING PSILOCYBIN MUSHROOMS  
APPEARING ACROSS THE UNITED STATES**

**- RESPONSES REQUESTED -**

Editor's Preface: In April and May 2003, the DEA Office of Forensic Sciences received multiple reports of homemade chocolates containing ground-up psilocybin mushroom parts. Three of the reports were from State and Local forensic laboratories and/or police departments in Ohio, Oregon, and Rhode Island. The fourth was reported by the DEA Mid-Atlantic Laboratory (Largo, Maryland), and was seized in Virginia. Additionally, a similar report concerning a seizure in Vail, Colorado was published in the National Drug Intelligence Center's (NDIC's) April 29, 2003 issue of the *Narcotics Digest Weekly*. The NDIC report also included a summary brief of a number of similar seizures dating back as far as two years.

In several cases, the seizures were multi-kilo. There were two common elements among most of the seizures: First, the chocolates all appeared to have been made from molds - in several cases, using candy molds, and in other cases apparently using ice-cube trays (and the seizure in Virginia was received in an ice-cube tray). In addition, in several cases, the chocolates were wrapped in colored foil.



These reports are the first seen by the Office of Forensic Sciences. As noted above, however, the NDIC report indicates that similar exhibits were seized in the Vail, Colorado area as long as two years ago, and furthermore refers to additional seizures made in Colorado, Georgia, North Carolina, Oregon, West Virginia, and Wisconsin since the initial seizure in Vail. The NDIC brief also indicates that the source may be “psilocybin mushroom cultivators in Oregon and Washington who transport the drug via package delivery services”, and reported the seizures of over 250 pounds of material in nine incidents by an airport interdiction team in Portland, Oregon. The above referenced report from the Oregon State Police Forensic Laboratory in Portland confirmed five such seizures since October 2002 (probably included in the NDIC total).

The first report of these chocolates (from North Ridgefield, Ohio) in *Microgram Bulletin* was reported in the May 2003 issue. The other three referenced seizures (or sets of seizures) are reported below. The above referenced intelligence brief from the *Narcotics Digest Weekly* is also reproduced below.

**RESPONSES REQUESTED:** The widespread appearances, seizure amounts, and similarities of preparation (candy molds or ice cube trays) and sales packaging (wrapping in colored foil), suggest the possibility of a common source (or a loose confederation of sources) and a nationwide distribution network. The DEA Dangerous Drugs Strategic Intelligence Unit (NTSG) and the National Drug Intelligence Center (NDIC) are both interested in this issue. Subscribers are asked to forward details to NTSG by FAX to 202/307-7916, Attn: J. Hines; and to NDIC by email to < [ronald.strong2@usdoj.gov](mailto:ronald.strong2@usdoj.gov) >.

\* \* \* \* \*

### IN PORTLAND, OREGON

[Summary Report] Beginning in October 2002, the Oregon State Police Forensic Lab in Portland, Oregon received four separate submissions of chocolate candies containing ground psilocybin mushrooms from the Portland Airport Interagency Narcotics Team (PAINT). The candies were molded into various shapes, including eggs, butterflies, bugs, Halloween-theme designs, and Reese's-type cups, and arrived wrapped in metallic foils of assorted colors (see Photos 1 - 2). In all four cases, the concoctions were being shipped via Federal Express to



Photo 1

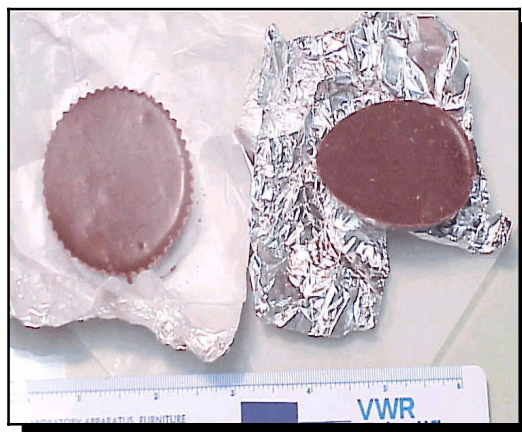
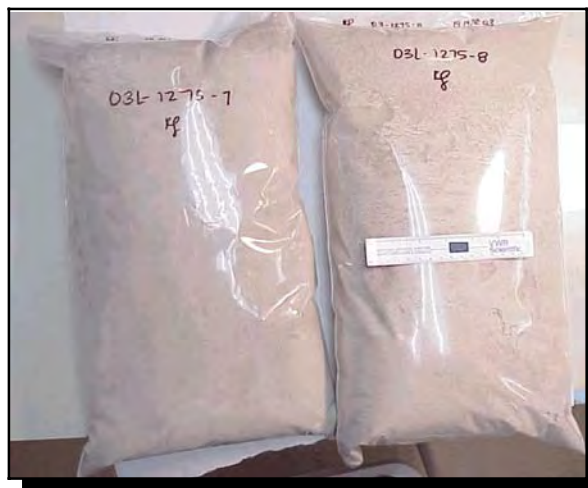


Photo 2

locations nationwide. In the largest case, the total net weight of the concoctions exceeded 11 kilograms. A later submission contained nearly 5 kilograms of finely ground mushroom material (see Photo 3), and also included the food processor used for grinding the mushrooms.

Under magnification, grey flakes were visible throughout the chocolate matrix on all exhibits. Samples were analyzed as follows: The concoctions were crushed, soaked in dilute sulfuric acid, and washed with chloroform (to remove some of the fatty components). The acidic layer was isolated, basified with aqueous NaOH to pH 10, and extracted with chloroform. Analysis of the extract by GC/MS indicated caffeine (from the chocolate) and confirmed psilocin. UV spectrophotometry on the final chloroform extract displayed a broad absorption in the region consistent with psilocin/psilocybin, but it was too similar to the UV from a blank chocolate extract to be considered conclusive. A second analysis was conducted by particle-picking specks of the mushroom material from the concoctions (see Photo 4), adding fresh Weber's color test reagent to them, and noting a color change from red to blue upon addition of a drop of concentrated HCl (positive for psilocin). Quantitation was not performed on any of the exhibits.



**Photo 3**



**Photo 4**

[Editor's Notes: According to the submitter, the relative percentage of mushrooms varied significantly between seizures; this indicates poor "quality control" and the potential for overdosing. Additionally, the submitter indicated that a subsequent (fifth) case was seized from a UPS package; this confirms that any parcel delivery service may be utilized for shipment. The latter case was handled by the Portland Police Department (no further information).]

\* \* \* \* \*

### **IN SOUTH KINGSTOWN, RHODE ISLAND**

The Drug Chemistry Section of the Rhode Island State Forensic Laboratory (Providence, Rhode Island) recently received a submission of two pieces of chocolate "candy" reported to contain psilocin (See Photos 5 and 6, next page). The exhibits were seized in South Kingstown by the South Kingstown Police Department from an individual who was trying to sell them to students at a local public school. The chocolates weighed 16 grams each, and were individually wrapped



**Photo 5**



**Photo 6**

in colored foil (see upper right quadrant of Photo 5). After cutting the pieces in half, visual inspection confirmed that small pieces of (presumed) mushroom pieces were mixed into the chocolate (see Photo 6). The mixtures were otherwise homogenous, suggesting that the mushroom pieces had been mixed with hot, liquified chocolate, and the resulting concoction allowed to harden in some type of mold (possibly an ice cube tray). Analysis of a 6% acetic acid/chloroform extract by GC/MS and UV confirmed psilocin (quantitation was not performed). This is the first time the laboratory has received a submission of this type.

\* \* \* \* \*

### **IN RICHMOND, VIRGINIA**

The DEA Mid-Atlantic Laboratory (Largo, Maryland) recently received an unusual exhibit consisting of one 14-section plastic ice cube tray with each compartment containing a cube of hardened mixture of chocolate and plant material, suspected containing psilocybin mushrooms (see Photo 7). The exhibit (total net mass 354.2 grams) was seized from a residence in Richmond, Virginia by agents from the DEA Richmond District Office, and was ancillary to an MDMA seizure. Analysis by GC/MS confirmed psilocin (quantitation was not performed). The exhibit was unusual in that the relative percentage of mushroom material to chocolate was quite high, varying between 10 and 20 percent by volume, and the mushrooms were also “sandwiched” between two layers of chocolate, not evenly distributed. In addition, the chocolate was a much lighter color than “normal” chocolate (see Photo); it was unclear whether this was due to the method of preparation, or if a lighter



**Photo 7**

colored variety of chocolate was used. This was the first submission of a chocolate/psilocybin mushroom concoction to the Mid-Atlantic Laboratory.

[Editor's Notes: According to the Case Agent, the perpetrators in this case were making the concoction themselves, not receiving it from an outside source. The mushrooms were allegedly provided by a relative in New England.]

\* \* \* \* \*

## **IN VAIL, COLORADO**

**From the April 29, 2003 issue of the *Narcotics Digest Weekly*  
(Reprinted with Permission)**

**Colorado:** The Vail Police Department reports that local independent dealers increasingly are distributing chocolate-coated psilocybin mushrooms wrapped in multicolored foil--a practice that was first reported in the Vail area approximately 18 to 24 months ago. The chocolate-coated psilocybin mushrooms typically are distributed at area concerts and private parties for \$10 per 1-inch cube. Police officials believe that distributors are supplied by psilocybin mushroom cultivators in Oregon and Washington who transport the drug via package delivery services.

*NDIC Comment:* Coating psilocybin mushrooms in chocolate provides traffickers with an effective method of concealment and enables abusers to ingest the drug in public settings. Law enforcement reporting indicates that chocolate-coated psilocybin mushroom distribution has recently increased in several areas of the United States, including Colorado, Georgia, North Carolina, Oregon, West Virginia, and Wisconsin. Moreover, law enforcement reporting indicates that Portland, Oregon, is one of the primary source areas for chocolate-coated psilocybin mushrooms. From September 2002 to April 2003, law enforcement authorities with the Portland Police Bureau, DEA, and the Portland Airport Interagency Narcotics Team (PAINT) seized over 250 pounds of chocolate-coated psilocybin mushrooms in nine incidents. The psilocybin mushrooms were being transported from Oregon to markets throughout the United States via package delivery services.

\* \* \* \* \*

## **- INTELLIGENCE BRIEF -**

### **VERY LARGE ECSTASY LABORATORY SEIZED IN BANGOR, PENNSYLVANIA**

In early December 2002, agents from the Pennsylvania Office of Attorney General, Bureau of Narcotics Investigation (BNI), seized a very large MDMA production laboratory in Bangor, Pennsylvania (located about 90 miles north of Philadelphia). A supply and storage warehouse in nearby Roseto was also seized; this latter facility was acting as a front company to purchase precursor and essential chemicals - the nominal purpose of which was to create flavoring ingredients for fruit juices. Unusually, the laboratory was located within a 30,000 gallon steel



drum that had been mostly buried underneath the very long driveway of the operator's rather isolated residence, and was further obscured from view and camouflaged with large boulders (see Photos 8 and 9).



**Photo 8**



**Photo 9**

Safrole and sassafras oil were both recovered. Based on the various chemicals found at the site, the operator was apparently converting safrole to isosafrole, oxidizing isosafrole to the corresponding phenylacetone, and using methylamine (probably produced from acetamide) to produce MDMA via an aluminum amalgam reduction. A tableting press was also recovered (see Photo 10). Tablets purchased during the investigation and recovered at the laboratory site (approximately 4,000) weighed 290 - 295 milligrams each, and were brownish-white, plain (no logo), and unscored (see Photo 11; closeup photo not available). Analysis confirmed MDMA (quantitation not reported). Agents on-site estimated that the laboratory had been in operation for at least two years, and was capable of producing more than one million Ecstasy tablets per year - making it likely the largest MDMA laboratory ever seized in the eastern United States. The tablets were distributed throughout the (local) Lehigh Valley and also in several nearby states.



**Photo 10**



**Photo 11**

**- INTELLIGENCE BRIEF -**

**POLYDRUG SEIZURES, INCLUDING “ICE” METHAMPHETAMINE,  
IN FORT LAUDERDALE, FLORIDA**

The Broward Sheriff's Office Crime Laboratory (Fort Lauderdale, Florida) recently received a number of interesting exhibits from the Fort Lauderdale Police Department. Seized at a local residence were three bags of suspected “Ice” methamphetamine, total net mass 19.7 grams (see Photo 12). Analysis by GC/MSD and by chemical derivatization confirmed methamphetamine (not quantitated). Also seized at the location were 57 orange colored tablets with a “ying/yang” logo, total net mass 19.8 grams, suspected Ecstasy (see photo 13). Analysis, however, indicated not MDMA but rather 3,4-methylenedioxy-amphetamine (MDA) (not quantitated). Finally, 10 green tablets with an unidentified logo (possibly an animal head), were also seized, net



**Photo 12**



**Photo 13**



**Photo 14**

mass not reported, suspected Ecstasy (see Photo 14). Analysis confirmed MDMA (not quantitated).

Also submitted as a result of an (unrelated) vehicle stop was a FedEx box containing three exhibits. The first was a bag of white crystalline material, net mass 672.7 grams, suspected “Ice” methamphetamine (photo not available). Analysis by GC/MSD and by chemical derivatization confirmed methamphetamine (not quantitated). The second was 48 boxes of 10 mL injectable



vials, each labelled “Ketaphorte 1000 mg Anesthesia Injectable, Cosulte al Medico Veterinario, ketamina base 100 mg” (photo not available). Analysis by GC/MSD and UV confirmed ketamine (not quantitated). The third was a red tablet with a "TP" logo, suspected Ecstasy (photo not available; net mass not reported). Analysis by GC/MSD and chemical derivatization indicated a mixture of methamphetamine, MDMA, and caffeine. This second set of seizures was notable because the “Ice” methamphetamine exhibit was the largest ever submitted to the Broward Sheriff's Office Crime Laboratory.

\* \* \* \* \*

#### **- INTELLIGENCE BRIEF -**

##### **MDMA TABLETS WITH A “DOVE” LOGO IN REDDING, CALIFORNIA**

The California Department of Justice, Bureau of Forensic Services, Redding Criminalistics Laboratory (Redding, California - approximately 150 miles north of Sacramento) recently received six light green pills (approximately 7 mm x 4-5 mm) with a dove logo, submitted as an unknown (see Photo 15). The pills were obtained in Redding by the Redding Police Department, as a result of a traffic stop; two baggies of cocaine were also seized. Analysis of the tablets by color testing and GC/MS confirmed MDMA (not quantitated). A tablet similar to this submission was found on the Internet ([www.dancesafe.org/labtesting/](http://www.dancesafe.org/labtesting/)), but this was the first time these type of pills have been submitted to the Redding Laboratory.



**Photo 15**

\* \* \* \* \*

#### **- INTELLIGENCE BRIEF -**

##### **TABLETS CONTAINING MIXED PIPERAZINES IN ALGONA, IOWA**

The Iowa Division of Criminal Investigation Criminalistics Laboratory (Des Moines, Iowa) recently received three pink tablets, composition unknown, total net mass 450 milligrams. The tablets measured 10 mm x 4 mm and had an indistinct logo (see Photo 16). The exhibits were seized in Algona by the Algona Police Department as a result of a vehicle stop to serve an arrest warrant for methamphetamine manufacture. Analysis by TLC and GC/MS indicated a mixture of benzylpiperazine (BZP), trifluoromethylphenylpiperazine (TFMPP), and *ortho*-methoxyphenylpiperazine (OMPP) (quantitation not performed, but all three compounds showed strong peaks in the GC/MS run). The tablets appear to be



**Photo 16**

quite similar in color and composition to mixed piperazine tablets previously reported in *Microgram Bulletin*. This is the first encounter of these federally controlled Schedule I substances in Iowa. BZP, TFMPP, and OMPP are not yet scheduled in Iowa; however, it is anticipated they will become Schedule I (Iowa) by next year.

\* \* \* \* \*

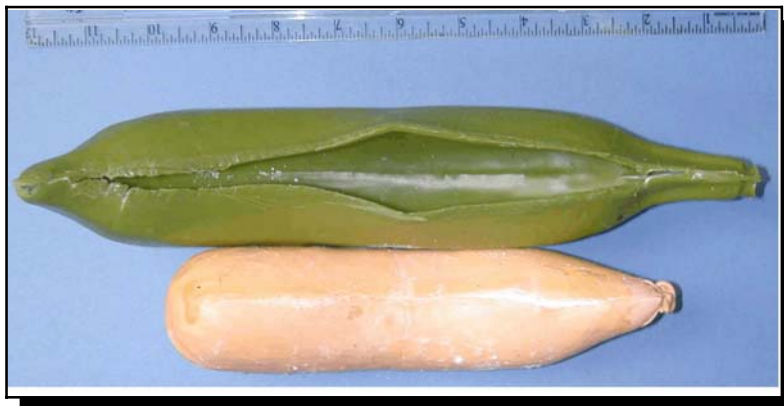
### **- INTELLIGENCE BRIEF -**

#### **COCAINE IN PLASTIC PLANTAINS IN STATEN ISLAND, NEW YORK**

The DEA Northeast Laboratory (New York, New York) recently received an unusual submission of green plastic plantains containing suspected cocaine (see Photo 17). The plantains were seized by U.S. Coast Guard and the DEA-NY Task Force from a shipping container that was destined for New York City. Each plantain measured approximated 12.5 x 2.5 inches, and contained a cylinder of compressed powder within a balloon (see Photo 18). Analysis by GC/MS, FTIR, and GC confirmed 75 percent cocaine hydrochloride. In all, 702 plantains contained a total net mass of 90.05 kilograms. Although this laboratory has analyzed many cocaine samples from variety of smuggling techniques, this was the first encounter of this particular method of concealment.



**Photo 17**



**Photo 18**

**- INTELLIGENCE BRIEF -**

**“LIQUID HEROIN” IN RUM BOTTLES AT JFK AIRPORT, NEW YORK**

The DEA Northeast Laboratory (New York, New York) recently received three “Havana Club” rum bottles containing a brown-colored liquid, that field-testing indicated contained heroin (see Photo 19). The bottles were seized by U.S. Customs at JFK International Airport in Queens, New York, from a passenger arriving from Cali, Colombia. Analysis by GC/MS, FTIR, and GC confirmed 319 milligrams heroin hydrochloride per milliliter. A total net mass of 702 grams of heroin hydrochloride was recovered from about 2.2 liters of liquid (suspected alcohol based, not further identified). Although this laboratory has analyzed many liquid cocaine samples, liquid heroin is very unusual. However, field intelligence suggests that this method of smuggling heroin may be encountered more frequently in the near future.



**Photo 19**

\* \* \* \* \*

**- INTELLIGENCE BRIEF -**

**COCAINE BRICK PRESS SEIZED IN MIAMI, FLORIDA**

The DEA Southeast Laboratory (Miami, Florida) recently received a cocaine brick mold contaminated with white powder, plus two additional exhibits of white powder, one of which was recovered from the mold, suspected to be cocaine or a cocaine adulterant/diluent. The exhibit was seized from a private residence in Miami by personnel from the DEA Miami Field Division. A hydraulic press was also found at the residence, but was not submitted to the laboratory. At the time of seizure, the powder was being compressed into a brick. The mold inside dimensions were approximately 8 x 6 x 3 inches (see Photo 20).



**Photo 20**

Analysis of the powder being pressed in the mold (total net mass 665.9 grams) by GC/FID and GC/MS confirmed 15 percent cocaine hydrochloride, cut with tetracaine and caffeine. Analysis of the second powder exhibit (total net mass 277.0 grams) identified it to be a mixture of tetracaine and caffeine. This was the first seizure of a cocaine brick mold to the Southeast Laboratory.

[Editor's Notes: According to the analyst, the evidence and related intelligence confirmed that the perpetrators were cutting higher purity cocaine and repressing it for sale. This would mimic analogous cocaine and heroin “pelleting” operations previously reported in *Microgram Bulletin*.]

**- INTELLIGENCE BRIEF -**

**RED “CRACK” IN NAPOLEONVILLE, LOUISIANA**

The DEA South Central Laboratory (Dallas, Texas) recently received a submission of eight plastic, knotted baggies, each containing a red, hard chunky material, suspected cocaine base, total net mass 48.1 grams (see Photo 21). The exhibit was purchased by DEA New Orleans in Napoleonville, Louisiana (south of Baton Rouge and west of New Orleans). Analysis by color testing, FTIR, ATR, GC/MS, and HPLC confirmed 54 percent cocaine base. The red color was apparently due to food coloring or a similar dye (not further investigated). Of note, the red color gave some interference with typical color tests. Cocaine base is routinely analyzed by the South Central Laboratory, but it is usually seen as an off-white or beige color.



**Photo 21**

[Editor’s Note: According to the Case Agent, the red coloring was not a marketing ploy, but rather an effort to pass the cocaine off as candy or cookie parts in case of approach by law enforcement personnel.]

\* \* \* \* \*

**- INTELLIGENCE BRIEF -**

**PSILOCIN/TETRAHYDROCANNABINOL MIXTURE IN VISTA, CALIFORNIA**

The DEA Southwest Laboratory (San Diego, California) recently received an unusual sample consisting of a ziploc bag containing a brown/gray substance suspected to be psilocin, net mass 11.5 grams (photo not available). The exhibit was seized by DEA personnel in Vista, California. After extraction from a sodium bicarbonate triturate into ether, however, analysis by GC/MS indicated not just psilocin but rather a mixture of psilocin and delta 9-tetrahydrocannabinol (THC), cannabinol, and cannabidiol. Further investigation using a microscope (under 10x magnification) determined that no marijuana was present; however, the microscopic examination revealed that vermiculite was mixed into the sample. Vermiculite is an absorptive substance used as a packing material and also as a support media for growing plants. It is speculated that the vermiculite present in the sample had been previously used in a marijuana grow operation, and thereby absorbed the cannabinoids that were identified in the extract. Of note, the other psilocin samples submitted in this case contained no vermiculite or cannabinoids.

\* \* \* \* \*

## **Selected Intelligence Brief**

### **Information Bulletin: *Salvia Divinorum*.**

**National Drug Intelligence Center  
319 Washington St., 5th Floor  
Johnstown, PA 15901**

[Unclassified; Reprinted With Permission]

[This Information Bulletin is an overview of the distribution and abuse of *Salvia Divinorum*, an herb that contains the hallucinogen Salvinorin A. It includes a discussion of the drug's background, abuse, availability, federal legislation, and outlook.]

\* \* \* \* \*

The distribution and abuse of *Salvia divinorum* or *S. divinorum*, a plant that contains the hallucinogen Salvinorin A, are becoming an increasing concern for law enforcement officials in the Northeast, Midwest, and Pacific regions of the country. Neither *Salvia divinorum* nor Salvinorin A is federally regulated in the United States or controlled in any other country except Australia, which adopted controlling legislation in 2002. Thus, *Salvia divinorum* is openly distributed via Internet sites and "head shops" located in California, Hawaii, Missouri, New York, Washington, and Wisconsin.

#### **Background**

*Salvia divinorum* (pronounced SAL-vee-ah dee-vin-OR-um)--frequently referred to as "Ska Maria Pastora" and "Diviner's Sage"--is a perennial herb in the mint family that resembles sage. The plant is native to certain areas of the Sierra Mazateca region of Oaxaca, Mexico, but can be grown in any humid, semitropical climate as well as indoors. Within the United States, the plant primarily is cultivated in California and Hawaii. It grows in large clusters and reaches over 3 feet in height.

Salvinorin A is the active component of *Salvia divinorum*. Other plants with similar properties include *Cannabis sativa*, which contains tetrahydrocannabinol, the primary psychoactive compound in marijuana and *Artemisia absinthium*, known as wormwood and used to make absinthe. At this time there is no accepted medical use for *Salvia divinorum*; however, Mazatec Indians in Mexico use the plant in traditional healing ceremonies and to induce visions. The manner in which *Salvia divinorum* interacts with the brain to produce its hallucinogenic effect remains unclear.

#### **Abuse**

Abusers ingest *Salvia divinorum* using various methods of administration. Like tobacco, *Salvia divinorum* can be smoked or chewed. It also can be brewed and ingested as a tea. When converted into a liquid extract, *Salvia divinorum* also can be vaporized and inhaled. Immediately after ingesting the drug, abusers typically experience vivid hallucinations--including out-of-body experiences, sensations of traveling through time and space, and feelings of merging with inanimate objects. Some abusers experience intense synesthesia, an effect that causes the abusers' senses to become confused. For



example, abusers may describe hearing colors or smelling sounds. The hallucinogenic effects generally last 1 hour or less unlike other hallucinogens like LSD and PCP. High doses of the drug can cause unconsciousness and short-term memory loss.



**Salvia divinorum leaf. © Drugid**

The long-term effects of *Salvia divinorum* abuse are unknown, as medical studies undertaken to examine the drug's physiological effects have focused only on short-term effects. However, information provided by abusers indicates that the negative long-term effects of *Salvia divinorum* may be similar to those produced by other hallucinogens such as LSD (lysergic acid diethylamide) including depression and schizophrenia. Some abusers also indicate that long-term abuse can cause hallucinogen persisting perception disorder, or "flashbacks". Numerous individuals report experiencing negative effects during their first experience with *Salvia divinorum* and indicate that they would not use it a second time. Some others report that the drug caused them to become introverted and sometimes unable to communicate clearly.

National surveys conducted to estimate rates of drug abuse do not include questions regarding abuse of *Salvia divinorum*. Thus, current levels of abuse are difficult to determine. Most likely, the abuser population is limited and primarily consists of young adults and adolescents who frequent "head shops" or have been influenced by Internet sites promoting the drug. The percentage of first-time users who become regular abusers of the substance also is difficult to determine; however, one Internet distributor indicated that only 1 in 10 customers places a repeat order for the drug.

#### **Adolescent Abuse of *Salvia Divinorum* in St. Peters, Missouri**

Law enforcement officials in St. Peters, Missouri, indicate that *Salvia divinorum* abuse by young people in that area is extremely high. Abuse levels among youths are so high that St. Peters became the first community to enact a local ordinance designed to regulate the distribution of *Salvia divinorum*. The ordinance--enacted in January 2003--makes it unlawful "for any person to engage in the sale or distribution of *Salvia divinorum* a/k/a Salvinorin A, or any variation thereof, to an individual who is seventeen years of age or younger". The ordinance does not apply to the distribution of *Salvia divinorum* by a family member on private property. Violations of the city ordinance are punishable by a \$25 fine for the first offense, \$100 for the second offense, and \$250 for the third and subsequent



offenses. According to the city's Board of Aldermen, enactment of the ordinance was necessary due to high rates of abuse by adolescents and concerns that the herb poses a threat to the health, safety, and welfare of residents of St. Peters.

### **Availability**

Salvia divinorum most often is distributed via the Internet and at some "head shops" in California, Hawaii, Missouri, New York, Washington, and Wisconsin. Prices for Salvia divinorum vary widely but are generally higher for plants grown in Hawaii and Sierra Mazateca (Central Mexico). An ounce of Salvia divinorum leaves sells for \$15 to \$120 while Salvia divinorum plants generally sell for \$20 to \$45 each. Liquid extract of Salvia divinorum--produced by crushing the leaves of the plants and using solvents to extract Salvinorin A--sells for \$110 to \$300 per ounce. Purchased primarily via the Internet, Salvia divinorum is transported to customers via package delivery services.



**Salvia divinorum plants. © Drugid**

### **Federal Legislation**

The production, distribution, and abuse of Salvia divinorum or Salvinorin A currently are not federally regulated as the drug is not listed under Title 21 U.S. Code §812 of the Controlled Substances Act. However, HR 5607 (the Hallucinogen Control Act of 2002)--introduced in Congress on October 10, 2002--contains provisions to regulate Salvia divinorum and Salvinorin A. This bill was not acted upon when the 107th Congress adjourned, but is expected to be reintroduced during the current session. In response to the introduction of legislation on Salvia divinorum, a group has formed to lobby Congress to fight any attempts to regulate the use or availability of Salvia divinorum and Salvinorin A in the United States.

### **Outlook**

Increasing numbers of young adults and adolescents most likely will experiment with Salvia divinorum as the drug currently is unregulated and readily available via the Internet and "head shops". Salvia divinorum most likely will not become widely abused at social events such as raves and dance parties. The drug often causes some individuals to become introverted, and abusers at such events tend to seek drugs that enhance social interaction such as MDMA (3,4-methylenedioxymethamphetamine, also known

as ecstasy). Proposed federal legislation to control *Salvia divinorum* and Salvinorin A may impact its availability, as distributors may be hesitant to sell the drug openly.

## Sources

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- \* Drugid
- \* Falkowski, Carol. *Dangerous Drugs; An Easy-to-Use Reference for Parents and Professionals*. Center City, Minnesota: Hazelden, 2003
- \* Los Angeles High Intensity Drug Trafficking Area
- \* Los Angeles Times
- \* Milwaukee Journal Sentinel
- \* The New York Times
- \* St. Peters (MO) Police Department

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## CLARIFICATION OF LISTING OF “TETRAHYDROCANNABINOLS” IN SCHEDULE I AND EXEMPTION FROM CONTROL OF CERTAIN INDUSTRIAL PRODUCTS AND MATERIALS DERIVED FROM THE CANNABIS PLANT; FINAL RULES

[Reprinted from the Code of Federal Regulations, Friday, March 21, 2003, pps. 14114 - 14126]

[Note: Slightly Edited to Fit *Microgram Bulletin* Format]

### DEPARTMENT OF JUSTICE

#### Drug Enforcement Administration

#### 21 CFR Part 1308

#### [DEA-205F]

#### RIN 1117-AA55

#### Clarification of Listing of “Tetrahydrocannabinols” in Schedule I

**AGENCY:** Drug Enforcement  
Administration, Department of  
Justice.

**ACTION:** Final rule.

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**SUMMARY:** The Drug  
Enforcement Administration (DEA)  
is revising the wording of the DEA

regulations to clarify that the listing  
of “Tetrahydrocannabinols” (THC)  
in schedule I of the Controlled  
Substances Act (CSA) and DEA  
regulations refers to both natural  
and synthetic THC.

**DATES:** This final rule becomes  
effective on April 21, 2003.

**FOR FURTHER  
INFORMATION CONTACT:**  
Frank Sapienza, Chief, Drug and  
Chemical Evaluation Section, Drug  
Enforcement Administration,  
Washington, DC 20537; Telephone:  
(202) 307-7183.

#### **SUPPLEMENTARY INFORMATION:**

**What Does This Rule Accomplish  
and by What Authority Is It  
Being Issued?**

This final rule clarifies that,  
under the CSA and DEA  
regulations, the listing of  
“Tetrahydrocannabinols” in  
schedule I refers to both natural and  
synthetic THC.

This rule is being issued  
pursuant to 21 U.S.C. 811, 812, and  
871(b). Sections 811 and 812  
authorize the Attorney General to  
establish the schedules in  
accordance with the CSA and to  
publish amendments to the  
schedules in the Code of Federal  
Regulations, part 1308 of title 21.  
Section 871(b) authorizes the  
Attorney General to promulgate  
and enforce any rules, regulations,  
and procedures which he may deem  
necessary and appropriate for the  
efficient enforcement of his  
functions under the CSA. These  
functions vested in the Attorney  
General by the CSA have been  
delegated to the Administrator and

Deputy Administrator of DEA. 21 U.S.C. 871(a); 28 CFR 0.100(b) and 0.104, appendix to subpart R, sec. 12.

### **Why Is There A Need To Clarify The Meaning of “Tetrahydrocannabinols”?**

As DEA explained in its October 9, 2001 interpretive rule (66 FR 51530; hereafter “interpretive rule”), it is DEA's interpretation of the plain language of the CSA and DEA regulations that the listing of “Tetrahydrocannabinols” in schedule I refers to both natural and synthetic THC. Despite the wording of the statute, some members of the public were under the impression (prior to the publication of the interpretive rule) that the listing of “Tetrahydrocannabinols” in schedule I includes only synthetic THC--not natural THC. To eliminate any uncertainty, DEA is hereby revising the wording of its regulations to refer expressly to both natural and synthetic THC.

### **Why Should Natural THC Be Considered a Controlled Substance?**

There are several reasons why natural THC should be considered a controlled substance. First, as explained in the interpretive rule, it is evident from the plain language of the CSA that Congress intended all THC--natural or synthetic--to be a schedule I controlled substance. Congress did so by listing “Tetrahydrocannabinols” in schedule I of the CSA--without limiting “Tetrahydrocannabinols” to either natural or synthetic form. 21 U.S.C. 812(c), Schedule I(c)(17). The basic dictionary definition of the word “tetrahydrocannabinols” refers collectively to a category of chemicals--regardless of whether such chemicals occur in nature or are synthesized in the laboratory.\1\

\1\ For example, Merriam - Webster's Collegiate Dictionary (10th ed. 1999) defines “THC” as “a physiologically active chemical C<sub>21</sub>H<sub>30</sub>O<sub>2</sub> from hemp plant resin that is the chief intoxicant in marijuana--called also tetrahydrocannabinol;” this definition does not mention synthetic THC.]

Second, every molecule of THC has identical physical and chemical properties and produces identical psychoactive effects, regardless of whether it was formed in nature or by laboratory synthesis.\2\ Likewise, a product that contains THC in a given formulation will cause the same reaction to the human who ingests it regardless of whether the THC is natural or synthetic. Indeed, some researchers are currently investigating the possibility of using natural THC (extracted from cannabis plants) in drug products.\3\

\2\ In this context, “every molecule of THC” refers to every molecule of the same isomer of THC. For example, all molecules of \9\-(trans)-THC are identical, regardless of whether they are natural or synthetic.

It should also be noted that “Tetrahydrocannabinols” refers to a class of substances which includes \9\-(trans)-THC, its isomers, and other related substances. Collectively, this class will be referred to in this document as “THC,” unless otherwise indicated.

\3\ At present, Marinol[reg] is the only THC-containing drug product that has been approved for marketing by FDA. Marinol[reg] contains synthetic dronabinol (an isomer of THC) in sesame oil and encapsulated in soft gelatin capsules. This product has been approved for the treatment of nausea and vomiting associated with cancer chemotherapy as well as the treatment of anorexia associated with weight loss in patients with AIDS. See 64 FR 35928 (1999) (DEA final order transferring Marinol[reg] from schedule II to schedule III).]

Third, regardless of its source, THC meets the criteria for classification in schedule I of the

CSA. It is an hallucinogenic substance with a high potential for abuse and no currently accepted medical use.\4\ See 21 U.S.C. 812(b)(1). Thus, for purposes of CSA scheduling, there is no basis for distinguishing natural THC from synthetic THC.

\4\ There are no FDA-approved drug products that consist solely of THC. However, as stated in the preceding footnote, the FDA has approved a drug product (Marinol[reg]), which contains synthetic THC with other ingredients in a specified product formulation.]

Fourth, to ignore the foregoing considerations and to treat natural THC as a noncontrolled substance would provide a loophole in the law that might be exploited by drug traffickers. If natural THC were a noncontrolled substance, those portions of the cannabis plant that are excluded from the CSA definition of marijuana (the stalks and sterilized seeds of the plant) would be legal, noncontrolled substances--regardless of their THC content. As a result, it would be legal to import into the United States, and to possess, unlimited quantities of cannabis stalks and sterilized seeds--again, regardless of their THC content. Anyone could then obtain this raw cannabis plant material to produce an extract of THC--all without legal consequence. This would give drug traffickers an essentially limitless supply of raw plant material from which they could produce large quantities of a highly potent extract that would be considered a noncontrolled substance and, therefore, entirely beyond the reach of law enforcement. To provide such a safe harbor to drug traffickers would be plainly at odds with the purpose and structure of the CSA.\5\

\5\ As one United States Court of Appeals has stated, “a reading of the [CSA] and its legislative history makes

it apparent that Congress, in legislating against drug use, intended to encompass every act and activity which could lead to proliferation of drug traffic. Nothing in the statute indicates any congressional intent to limit the reach of this legislation, which is described in its title as ‘Comprehensive.’” *United States v. Everett*, 700 F.2d 900, 907 (3d Cir. 1983) (internal citations omitted).]

### **Does This Rule Change the Legal Status of “Hemp” Products?**

This rule does not change the legal status of so-called “hemp” products (products made from portions of the cannabis plant that are excluded from the CSA definition of marijuana). Rather, this rule clarifies provisions of the law and regulations that have been in effect since 1971. For the reasons provided in the interpretive rule, it is DEA’s view that the CSA and DEA regulations have always (since their enactment more than 30 years ago) declared any product that contains any amount of tetrahydrocannabinols to be a schedule I controlled substance. This interpretation holds regardless of whether the product in question is made from “hemp” or any other material.

Nor does this rule add to, or subtract from, the exemptions issued by DEA in the October 9, 2001 interim rule. Every type of “hemp” product that was exempted from control under that interim rule will remain exempted following the finalization of this rule. Thus, given DEA’s interpretation of current law (expressed in the interpretive rule), this rule does not change the legal status of any “hemp” product.

### **What Is the Difference Between This Final Rule and the Previously-Issued Interpretive Rule?**

This final rule is a legislative rule. It is important to understand the difference between a legislative rule and an interpretive rule, such as

the interpretive rule on THC that DEA issued on October 9, 2001. The following is a brief explanation of the difference between legislative rules and interpretive rules.

Under the Administrative Procedure Act (APA), agencies may issue interpretive rules to advise the public of how the agency interprets a particular provision of a statute or regulation which the agency administers.<sup>[6]</sup> By definition, interpretive rules are simply the agency’s announcement of how it interprets existing law. Interpretive rules are not new laws and are not binding on the courts. Even though courts often defer to an agency’s interpretive rule, they are always free to choose otherwise.

[6] See *Shalala v. Guernsey Memorial Hosp.*, 514 U.S. 87, 99 (1995).]

Legislative rules, on the other hand, have the full force of law and are binding on all persons, and on the courts, to the same extent as a congressional statute.<sup>[7]</sup> Because of this crucial difference, the APA requires agencies to engage in notice-and-comment proceedings before a legislative rule takes effect.<sup>[8]</sup> By the same reasoning, since interpretive rules do not have the full force of law and are not binding on the courts, the APA expressly allows agencies to issue interpretive rules without engaging in notice-and-comment. 5 U.S.C. 553(b)(A), (d)(2).

[7] *National Latino Media Coalition v. F.C.C.*, 816 F.2d 785, 788 (D.C. Cir. 1987).

[8] *Syncor Int’l Corp. v. Shalala*, 127 F.3d 90, 95 (D.C. Cir. 1997) (“it is because the agency is engaged in lawmaking [when it issues a legislative rule] that the APA requires it to comply with notice and comment”).]

Consistent with these APA principles, DEA published the interpretive rule in October 2001 without notice and comment,

whereas the legislative rule that is being finalized in this document has gone through notice and comment. As a result, this final rule will have the full force of law and be binding on the courts--just as with all the other DEA regulations that have gone through notice and comment.<sup>[9]</sup> In contrast, the interpretive rule was not binding on the courts. The practical effect of this distinction can be seen by considering the following hypothetical scenarios. If, prior to the publication of this final rule, a federal prosecution was commenced based solely on DEA’s interpretive rule, the presiding court would have been free to choose between applying DEA’s interpretation or its own interpretation of the law. But once this rule becomes final, if a person were to refuse to abide by the regulation and a federal prosecution were commenced, the court would be required to apply the new regulation.<sup>[10]</sup>

[9] The DEA regulations are published in Title 21 of the Code of Federal Regulations, Part 1300.

[10] Legislative regulations are controlling on the courts unless they are “arbitrary, capricious, or manifestly contrary to the statute.” *Chevron, U.S.A. v. Natural Resources Defense Council*, 467 U.S. 837, 844 (1984).]

### **Comments That DEA Received in Response to the Proposed Rule**

Following publication of the proposed rule, DEA received comments from thousands of individuals and groups. The comments were in the form of original letters, form letters, petitions, and a cookbook. Those who submitted comments included companies that manufacture and distribute various “hemp” products, associations that represent such manufacturers and distributors, domestic and Canadian government officials, and individuals. These commenters expressed criticisms

on a variety of issues. In accordance with the APA, DEA carefully considered all of the comments it received.

Most of the comments that DEA received relate to both the proposed rule (DEA 205; 66 FR 51535) and the interim rule (DEA 206; 66 FR 51539), which were published together (along with the interpretive rule) in the October 9, 2001 **Federal Register**. Those comments that pertain primarily to DEA 205 are addressed in this final rule. Those comments that pertain primarily to DEA 206 are addressed in the final DEA 206 rule, which appears in a separate **Federal Register** document that immediately follows this document. Both DEA 205 and DEA 206 contain a summary of the pertinent comments, along with an explanation of how DEA considered them in deciding to finalize the rules.

The number of individuals and groups that participated in the comment process far exceeded the number of different issues raised. Many of the comments were similar to one another, partly because many persons submitted form letters or signed petitions written by groups which themselves submitted lengthy comments. In this document, together with the final rule finalizing the DEA 206 interim rule, DEA has addressed the major issues raised by the commenters. Some of these issues have already been addressed in the text that precedes this section. The remaining issues are addressed below and in the DEA 206 final rule.

#### *Comments Expressing Legal Disagreement With the Proposed Rule*

Many commenters disagreed with DEA's legal interpretation of those provisions of the CSA and DEA regulations that are relevant to the proposed rule. Specifically, these commenters disagreed with DEA's view that, under the plain language

of the CSA, "any material, compound, mixture, or preparation, which contains any quantity of \* \* \* Tetrahydrocannabinols (THC)" is a schedule I controlled substance. 21 U.S.C. 812(c), schedule I(c)(17); 21 CFR 1308.11(d)(27). These commenters asserted that THC content is irrelevant when it comes to products made from portions of the cannabis plant that are excluded from the definition of marijuana. According to these commenters, DEA should allow the CSA definition of marijuana to dictate which portions of the cannabis plant are controlled substances. DEA addressed this issue in detail in the legal analysis contained in the interpretive rule. Nonetheless, many commenters asserted that their point of view is the correct reading of the law and should be substituted for that of DEA. DEA reexamined this issue in view of the comments. While recognizing that many proponents of "hemp" products are steadfast in their view that natural THC content is irrelevant in deciding what is a controlled substance, DEA continues to believe that its interpretation follows directly from the plain language of the CSA and the DEA regulations and is consistent with the legislative history of the statute and regulations. Moreover, DEA believes that the analysis contained in the interpretive rule refutes all of the contrary legal arguments expressed in the comments. As the agency responsible for administering the CSA, it is DEA's obligation to ensure that the regulations clearly reflect what the agency believes are the purpose and intent of the Act.

#### *Comments as to Whether This Rule Constitutes a Rescheduling Action*

Some commenters expressed the view that this rule is a rescheduling action within the meaning of 21 U.S.C. 811 and that DEA should have gone through the procedures

set forth in that section prior to issuing this rule.<sup>[11]</sup> These comments appear to be based on a misunderstanding of the nature of the procedures under section 811. By its express terms, section 811 applies only where DEA seeks to add a substance to a schedule or remove one from a schedule. For example, if DEA were seeking to move a controlled substance from schedule II to schedule III, the agency would be required to follow the procedures set forth in section 811. The final rule being published today, however, does not change the schedule of THC or any other controlled substance. To the contrary, when this final rule becomes effective, on April 21, 2003, THC will remain in the same schedule in which it has been since the enactment of the CSA in 1970: Schedule I.

[11] Under 21 U.S.C. 811, to change the schedule of a controlled substance, DEA must first request from the Secretary of Health and Human Services a scientific and medical evaluation and scheduling recommendation and follow additional procedures set forth in section 811. However, as discussed above, section 811 is inapplicable where, as in this final rule, DEA is not changing the schedule of a controlled substance.]

Nor would engaging in the rescheduling procedures set forth in section 811 be consistent with the purpose of this rule. Section 811 sets forth the procedures to determine whether a particular substance meets the criteria for placement in a particular schedule. The purpose of this rule is not to determine whether THC meets the criteria for classification in schedule I; rather, this rule serves to clarify that the longstanding placement of THC in schedule I includes both natural and synthetic THC. There is no question about whether THC meets the criteria for placement in schedule I.<sup>[12]</sup> Even those commenters who suggested

that this rule should be issued under section 811 do not dispute that all THC (natural or synthetic) meets the criteria for placement in schedule I. As discussed above, the chemical THC has the identical physical and chemical properties, and produces the same psychoactive effects, regardless of whether it is natural or synthetic. For these reasons, section 811 is inapplicable to this rule.

[12] The criteria for placement in schedule I are: “no currently accepted medical use in treatment in the United States,” “a lack of accepted safety for use \* \* \* under medical supervision,” and “a high potential for abuse.” 21 U.S.C. 812(b)(1).]

#### *Comments Regarding Poppy Seeds*

Some of the commenters asserted that DEA should not take literally the plain language of the CSA: that “any material, compound, mixture, or preparation, which contains any quantity of \* \* \* Tetrahydrocannabinols [THC]” is a schedule I controlled substance. To read this provision literally, some commenters said, would mean that poppy seeds must be considered controlled substances if they contain trace amounts of opiates (such as morphine, codeine, or thebaine). This concern is unfounded because, under the CSA and DEA regulations, substances that contain opiates are controlled differently than substances that contain schedule I hallucinogens (such as THC). It is true that poppy seeds are excluded from the definition of opium poppy (21 U.S.C. 802(19)) just as sterilized cannabis seeds are excluded from the definition of marijuana. However, while it is the case that “any material, compound, mixture, or preparation, which contains any quantity of” an hallucinogenic controlled substance is a controlled substance (21 U.S.C. 812(c), schedule I (c); 21 CFR 1308.11(d)), it is not the case that any material, compound, mixture, or

preparation which contains any quantity of an opiate is a controlled substance. Rather, naturally-occurring opiates found in substances of vegetable origin are subject to control under the CSA only if they are extracted from the substances of vegetable origin. 21 U.S.C. 812(c), schedule II(a); 21 CFR 1308.12(b)).[13]

[13] Plant materials that are the source of narcotics, such as opium poppy, poppy straw, and opium, are specifically listed in schedule II. However, as stated above, the listing of opium poppy does not include poppy seeds, since the seeds are excluded from the definition of opium poppy.]

#### *Comments Regarding the Single Convention on Narcotic Drugs*

Several commenters asserted that the proposed rule is impermissible in view of a certain provision of the Single Convention on Narcotic Drugs, 1961 (“Single Convention”). The Single Convention, which the United States ratified in 1967, was designed to establish effective control over international and domestic traffic in controlled substances, and parties to the Convention are required to implement certain minimum measures. Article 28 of the Single Convention imposes on parties certain restrictions on the cultivation of the cannabis plant. However, paragraph 2 of Article 28 states that the Single Convention does not apply “to the cultivation of the cannabis plant exclusively for industrial purposes (fibre [sic] and seed) or horticultural purposes.” Several commenters asserted that this provision means that the United States is prohibited from imposing any restrictions on “hemp.” This assertion is incorrect.

The Single Convention sets minimum standards of drug control measures that the parties must

apply--not maximum measures. Parties are free to impose whatever additional measures they believe are necessary to prevent the misuse, and illicit traffic in, controlled substances. Indeed, various provisions of the CSA go beyond the minimum measures required by the Single Convention. Congress's decision under the CSA to control anything that contains “any quantity” of THC is the decisive factor for purposes of this rule, regardless of whether a less restrictive rule would be permissible under the Single Convention.[14]

[14] To fully address the distinctions between the control of cannabis under the Single Convention and the control of marijuana and THC under CSA would require a lengthy discussion. Such a discussion is unnecessary here because this rule is based on how THC is controlled under the CSA. Thus, there is no need to address here whether the reference in the Single Convention (Article 28, paragraph 2) to cannabis grown for “industrial” or “horticultural” purposes includes cannabis grown to make foods or beverages, or whether such reference is limited to non-human-consumption items such as rope, paper, textiles, industrial solvents, and birdseed.

A full analysis of the international drug control treaties would also require discussion of the Convention on Psychotropic Substances, 1971 (Psychotropic Convention). THC is a substance listed in the schedules of the Psychotropic Convention. Accordingly, the United States, as a party to the Psychotropic Convention, has certain obligations thereunder with respect to the control of THC. However, it is unnecessary to examine the scope of those obligations in this document because Congress stated expressly in United States domestic law that anything that contains “any



quantity” of THC is a schedule I controlled substance, unless listed in another schedule or expressly exempted. Adherence to this rule and the corresponding provisions of the CSA ensures that the United States meets its obligations under the Psychotropic Convention with respect to THC.]

#### *Comments Regarding Trade Agreements*

Some commenters expressed the view that the proposed rule violates certain obligations of the North American Free Trade Agreement (NAFTA) and the World Trade Organization (WTO) agreements. Many of these same commenters expressed these assertions to DEA before the proposed rule was published in October 2001. As a result, both before and after publication of the proposed rule, DEA sought the input of the Department of State and other components of the Executive Branch with the relevant expertise and responsibility for such matters and concluded that the proposed rule--which simply clarifies longstanding federal law with respect to schedule I hallucinogenic controlled substances--does not violate NAFTA or the WTO agreements.

One of the bases for these treaty claims asserted by commenters is the contention that the proposed rule provides more favorable treatment to United States and foreign, non-Canadian investors and their investments than to Canadian “hemp” investors and their investments in the United States. In reality, the rule applies to and treats all “hemp” industry investors and their investments the same--i.e., regardless of nationality of ownership. No company (whether Canadian-owned, foreign but non-Canadian-owned, or United States-owned) can manufacture, distribute or market products used, or intended for use, for human

consumption that contain any amount of THC. DEA has made no exception to this rule for any United States company or any foreign company.

#### *Comments Requesting an Extension of the Comment Period*

Some commenters asked DEA to extend the comment period. DEA did not do so for the following reasons. In the notice of the proposed rule, DEA provided a 60-day comment period from the date of the publication in the **Federal Register**, which allowed ample time for any interested persons to express their opinions.

DEA considered all comments that were postmarked within the comment period, even where the agency did not receive the comments until several months after the comment period closed.<sup>15</sup> It is evident from the number and variety of comments that were submitted, and the detailed nature of such comments, that a wide range of viewpoints was expressed to the agency during the comment period. Nearly all of the types of comments that were submitted during the comment period were repeated many times over by a number of commenters, which further indicates that interested parties have had sufficient opportunity to express their comments.

<sup>15</sup> At the time the comment period closed, postal deliveries to DEA and other agencies were delayed after the widely-reported incidents of anthrax being sent through the mail. Because of this, although the proposed rule indicated that DEA would only consider comments received on or before December 10, 2001, the agency considered all comments postmarked by that date, even if they arrived late.]

DEA provided the public with advance notice of the rules. In the

year preceding the October 9, 2001 publication of the rules, DEA announced twice in the **Federal Register** that the agency would be issuing the proposed rule, along with the interpretive rule and the interim rule, and described the nature of the rules. See Department of Justice Unified Agenda, 66 FR 25624 (May 14, 2001), 65 FR 74024 (November 30, 2000). It is evident from the comments submitted on the proposed rule that the advance notice gave interested persons ample time to assemble and articulate their thoughts and opinions. Some of those persons who requested an extension of the comment period themselves submitted lengthy comments, indicating that they have already fully expressed their views. In light of these considerations, extending the comment period was unnecessary.

#### *Comments Regarding Economic Impact of the Proposed Rule*

Many commenters expressed concern about how the proposed rule might impact economically various businesses that deal in “hemp” products. These economic considerations are addressed in the next section of this document (regulatory certifications).

#### **Regulatory Certifications**

Certain provisions of Federal law and executive orders (specified below) require agencies to assess how their rules might impact the economy, small businesses, and the states. (Hereafter in this document, these provisions will be referred to collectively as the “certification provisions.”) DEA has conducted these certifications. However, before discussing the economics, the nature of this rule should be reiterated. This rule revises the wording of the DEA regulations to clarify for the public the agency's understanding of longstanding

federal law. In other words, through this rule, DEA is implementing what it believes to be the mandate of Congress under the CSA. (This mandate is that every substance containing THC be listed in schedule I, unless the substance is specifically exempted from control or listed in another schedule.) Regardless of how this rule might impact the economy, small businesses, or the states, DEA must carry out the mandate.

It is also critical to bear in mind that only a very narrow category of “hemp” products will be prohibited under the rules that DEA is publishing today. As a result of the exemptions issued by DEA under the interim rule, all “hemp” products that do not cause THC to enter the human body are entirely exempted from control, regardless of their THC content. Thus, items such as “hemp” clothing, industrial solvents, personal care products, and animal feed mixtures are considered noncontrolled substances (not subject to any of the CSA requirements) regardless of their THC content. This rule therefore causes no economic impact whatsoever on such exempted products.

It also must be considered that when Congress enacted the CSA, it created a system of controls that was comprehensive in scope to protect the general welfare of the American people within the context of the Act.<sup>[16]</sup> Incidental restrictions on economic activity resulting from enforcement of the CSA have never been viewed as a proper basis to cease such enforcement. The certification provisions are no exception to this principle.

[16] See 21 U.S.C. 801(2).]

Moreover, one of the chief aims of the certification provisions is to ensure that agencies consider the potential economic ramifications of imposing new regulations. This

rule, however, does not create any new category of regulation governing the handling of controlled substances. Rather, the rule merely helps to clarify what products are, or are not, subject to what DEA believes are preexisting CSA requirements.

DEA recognizes, however, that some members of the public disagree with DEA's interpretation of the law with respect to THC. As a result, some companies may be continuing to market in the United States “hemp” food and beverage products that contain THC. Accordingly, for purposes of calculating the economic impact of these rules, DEA has assumed THC-containing “hemp” foods and beverages are lawful products until this rule becomes final.

In the regulatory certifications that accompanied the proposed rule, DEA explained in detail its analysis of the economic activity relating to “hemp” food and beverage products (referred to therein and hereafter in this document as “edible ‘hemp’ products”). 66 FR at 51536-51537. In that analysis, using conservative assumptions (erring on the side of inclusiveness), DEA estimated that the total sales of edible “hemp” products in the United States is no more than \$20 million per year with no more than 500 persons employed in connection with these products. In the publication of the proposed rule, DEA urged any manufacturer or distributor of “hemp” products to submit during the comment period any data on this economic activity that might warrant adjustments to these estimates. The comments that DEA received suggest that the agency might have overestimated the amount of economic activity tied to edible “hemp” products. The highest estimate submitted by representatives of businesses that produce and distribute edible “hemp” products was that the total sales of such products in the United States is approximately \$6 million.

It also must be noted that not

every such edible product marketed as a “hemp” product is necessarily prohibited under the rule being finalized today. As DEA stated repeatedly in the text accompanying the proposed rule and the interim rule, if a product says “hemp” on the label but contains no THC (or any other controlled substance), it is not a controlled substance and, therefore, not affected by this rule. At least one “hemp” food company claims that its products are THC-free.<sup>[17]</sup> If this is correct, such products are not controlled substances and not prohibited by the CSA. Thus, even if the edible “hemp” products business is a \$6 million industry in the United States, some of that business might be able to continue under this final rule.

[17] On January 28, 2002, a company that sells “hemp” food products issued the following statement on its website (<http://www.thehempnut.com>): It is the position of HempNut, Inc. and the Hemp Food Association (HFA) that this Rule [published by DEA on October 9, 2001] is merely a clarification and confirmation of the basis under which DEA, US Customs, and all responsible hempseed importers have already been operating under for quite some time, namely, that hempseed products may not contain tetrahydrocannabinol (THC). A survey of hempseed importers revealed that all were in full compliance with the Rule, and have no THC in their products.]

The one other category of products that might be impacted economically by this rule is that in which pure cannabis seeds are sold as birdseed. (As set forth in the interim rule, which is being finalized today, DEA is exempting animal feed mixtures containing sterilized cannabis seeds with other ingredients, but not pure sterilized cannabis seeds.) In the regulatory

certifications attached to the proposed rule, DEA estimated that no more than \$77,000 worth of birdseed that contains cannabis seeds is imported into the United States for sale in this country. It appears likely that most of this birdseed is sold in a mixture that is exempted under the interim rule. Accordingly, the total amount of pure “hempseeds” sold as birdseed in this country is probably much less than \$77,000.

#### *Regulatory Flexibility Act*

For the reasons provided above, the Acting Administrator hereby certifies that this rule will not have a significant impact on a substantial number of small entities within the meaning of the Regulatory Flexibility Act (5 U.S.C. 605(b)). The economic activity that would be disallowed under this rule is already illegal under DEA's interpretation of existing law. Even if one were to assume that such economic activity were legal under current law, the prohibition on such activity resulting from this rule (summarized above) would not constitute significant impact on a substantial number of small entities within the meaning of the Regulatory Flexibility Act. Therefore, a final regulatory flexibility analysis is not required for this rule.

#### *Executive Order 12866*

This rule has been drafted and reviewed in accordance with Executive Order 12866, Regulatory Planning and Review, 1(b), Principles of Regulation. This rule has been determined to be a “significant regulatory action” under Executive Order 12866, 3(f). Accordingly, this rule has been reviewed by the Office of Management and Budget for purposes of Executive Order 12866.

#### *Executive Order 13132*

This rule does not preempt or modify any provision of state law; nor does it impose enforcement responsibilities on any state; nor does it diminish the power of any state to enforce its own laws. Accordingly, this rule does not have federalism implications warranting the application of Executive Order 13132.

#### *Executive Order 12988--Civil Justice Reform*

This rule meets the applicable standards set forth in sections 3(a) and 3(b)(2) of Executive Order 12988.

#### *Unfunded Mandates Reform Act of 1995*

This rule will not result in the expenditure by State, local, and tribal governments, in the aggregate, or by the private sector, of \$100,000,000 or more in any one year. Therefore, no actions are necessary under the Unfunded Mandates Reform Act of 1995.

#### *Small Business Regulatory Enforcement Fairness Act of 1996*

For the reasons provided above, this rule is not likely to result in any of the following: An annual effect on the economy of \$100,000,000 or more; a major increase in costs or prices for consumers, individual industries, federal, state, or local government agencies, or geographic regions; or significant adverse effects on competition, employment, investment, productivity, innovation, or on the ability of United States-based enterprises to compete with foreign-based enterprises in domestic and export markets. The economic activity disallowed under this rule is already illegal under DEA's interpretation of existing law. Even if one were to assume that such economic activity were legal under current law, the prohibition on such activity

resulting from this rule would not render the rule a major rule under the Small Business Regulatory Enforcement Fairness Act of 1996 (SBREFA), 5 U.S.C. 804. Therefore, the provisions of SBREFA relating to major rules are inapplicable to this rule. However, a copy of this rule has been sent to the Office of Advocacy, Small Business Administration. Further, a copy of this final rule will be submitted to each House of the Congress and to the Comptroller General in accordance with SBREFA (5 U.S.C. 801).

#### *Paperwork Reduction Act of 1995*

This rule does not involve collection of information within the meaning of the Paperwork Reduction Act of 1995.

#### **List of Subjects in 21 CFR Part 1308**

Administrative practice and procedure, Drug traffic control, Narcotics, Prescription drugs.

#### **Final Rule**

Pursuant to the authority vested in the Attorney General under sections 201, 202, and 501(b) of the CSA (21 U.S.C. 811, 812, and 871(b)), delegated to the Administrator and Deputy Administrator pursuant to section 501(a) (21 U.S.C. 871(a)) and as specified in 28 CFR 0.100 and 0.104, appendix to subpart R, sec. 12, the Acting Administrator hereby orders that Title 21 of the Code of Federal Regulations, part 1308, be amended as follows:

#### **PART 1308--[AMENDED]**

1. The authority citation for part 1308 continues to read as follows:

Authority: 21 U.S.C. 811, 812, 871(b), unless otherwise noted.

2. Section 1308.11(d)(27) is revised to read as follows:

**Sec. 1308.11 Schedule I.**

\* \* \* \* \*

(d) \* \* \*

(27) Tetrahydrocannabinols--7370

Meaning tetrahydrocannabinols naturally contained in a plant of the genus Cannabis (cannabis plant), as well as synthetic equivalents of the substances contained in the cannabis plant, or in the resinous extractives of such plant, and/or synthetic substances, derivatives, and their isomers with similar chemical structure and pharmacological activity to those substances contained in the plant, such as the following:

1 cis or trans  
tetrahydrocannabinol, and their optical isomers

6 cis or trans  
tetrahydrocannabinol, and their optical isomers

3, 4 cis or trans  
tetrahydrocannabinol, and its optical isomers

(Since nomenclature of these substances is not internationally standardized, compounds of these structures, regardless of numerical designation of atomic positions covered.)

\* \* \* \* \*

Dated: March 18, 2003.

**John B. Brown III,**

Acting Administrator.

[FR Doc. 03-6804 Filed 3-20-03;  
8:45 am]

**BILLING CODE 4410-09-P**

**DEPARTMENT OF JUSTICE**

**Drug Enforcement  
Administration**

**21 CFR Part 1308**

**[DEA-206F]**

**RIN 1117-AA55**

**Exemption From Control of  
Certain Industrial Products and  
Materials Derived From the  
Cannabis Plant**

**AGENCY:** Drug Enforcement  
Administration, Department of  
Justice.

**ACTION:** Final rule.

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**SUMMARY:** The Drug Enforcement Administration (DEA) is adopting as final an interim rule exempting from control (i.e., exempting from all provisions of the Controlled Substances Act (CSA)) certain items derived from the cannabis plant and containing tetrahydrocannabinols (THC). Specifically, the interim rule exempted THC-containing industrial products, processed plant materials used to make such products, and animal feed mixtures, provided they are not used, or intended for use, for human consumption (and therefore cannot cause THC to enter the human body).

**DATES:** This final rule becomes effective on April 21, 2003.

**FOR FURTHER**

**INFORMATION CONTACT:**

Frank Sapienza, Chief, Drug and  
Chemical Evaluation Section, Drug  
Enforcement Administration,  
Washington, D.C. 20537;  
Telephone: (202) 307-7183.

**SUPPLEMENTARY  
INFORMATION:**

**What Does This Rule Accomplish  
and by What Authority Is It  
Being Issued?**

This final rule revises the DEA  
regulations to add a provision

exempting from CSA control certain THC-containing industrial products, processed plant materials used to make such products, and animal feed mixtures, provided such products, materials, and feed mixtures are made from those portions of the cannabis plant that are excluded from the definition of marijuana and are not used, or intended for use, for human consumption. Among the types of industrial products that are exempted as a result of this final rule are: (i) Paper, rope, and clothing made from cannabis stalks; (ii) processed cannabis plant materials used for industrial purposes, such as fiber retted from cannabis stalks for use in manufacturing textiles or rope; (iii) animal feed mixtures that contain sterilized cannabis seeds and other ingredients (not derived from the cannabis plant) in a formulation designed, marketed, and distributed for animal (nonhuman) consumption; and (iv) personal care products that contain oil from sterilized cannabis seeds, such as shampoos, soaps, and body lotions (provided that using such personal care products does not cause THC to enter the human body).

This rule is being issued pursuant to 21 U.S.C. 811, 812, and 812(b). Sections 811 and 812 authorize the Attorney General to establish the schedules in accordance with the CSA and to publish amendments to the schedules in the Code of Federal Regulations, part 1308 of Title 21. Section 812(b) authorizes the Attorney General to promulgate and enforce any rules, regulations, and procedures which he may deem necessary and appropriate for the efficient enforcement of his functions under the CSA. In addition, the Attorney General is authorized to exempt, by regulation, any compound, mixture, or preparation containing any controlled substance from the application of all or any part of the

CSA if he finds such compound, mixture, or preparation meets the requirements of section 811(g)(3). These functions vested in the Attorney General by the CSA have been delegated to the Administrator and Deputy Administrator of DEA. 21 U.S.C. 871(a); 28 CFR 0.100(b) and 0.104, appendix to subpart R, sec. 12.

### **Why Is DEA Exempting From Control Certain THC-Containing Substances Not Intended for Human Consumption?**

Without the exemptions made by the interim rule, which are adopted as final in this rule, a wide variety of legitimate industrial products derived from portions of the cannabis plant would be considered schedule I controlled substances. For example, paper, rope, and clothing (made using fiber from cannabis stalks) and industrial solvents, lubricants, and bird seed mixtures (made using sterilized cannabis seeds or oil from such seeds) would, in the absence of the interim rule, be considered schedule I controlled substances if they contained THC. If such products were considered schedule I controlled substances, their use would be severely restricted.<sup>[1]</sup> Under the interim rule, however, which DEA is adopting as final here, DEA exempted such legitimate industrial products from control, provided they are not used, or intended for use, for human consumption. As explained below, DEA believes this approach protects the public welfare within the meaning of the CSA while striking a fair balance between the plain language of the Act and the intent of Congress under prior marijuana legislation.

[1] The CSA and DEA regulations permit industrial use of schedule I controlled substances, but only under strictly regulated conditions.]

THC is an hallucinogenic substance with a high potential for abuse. Congress recognized this fact by placing it in schedule I of the CSA. Because of this, there are only two ways that THC may lawfully enter a person's body: (1) If the THC is contained in a drug product that has been approved by the Food and Drug Administration (FDA) as being safe and effective for human use; <sup>[2]</sup> or (2) if an experimental drug containing THC is provided to a research subject in clinical research that has been approved by FDA and conducted by a researcher registered with DEA.<sup>[3]</sup> Disallowing human consumption of schedule I controlled substances except in the foregoing limited circumstances is an absolute necessity to conform with the CSA and protect the public welfare within the meaning of the Act.<sup>[4]</sup>

[2] 21 U.S.C. 331, 355, 811(b), 812(b). At present, Marinol<sup>[reg]</sup> is the only THC-containing drug product that has been approved for marketing by FDA. Marinol<sup>[reg]</sup> is the brand name of a product containing synthetic dronabinol (a form of THC) in sesame oil and encapsulated in soft gelatin capsules that has been approved for the treatment of nausea and vomiting associated with cancer chemotherapy as well as the treatment of anorexia associated with weight loss in patients with AIDS. Because Marinol<sup>[reg]</sup> is the only THC-containing drug approved by FDA, it is the only THC-containing substance listed in a schedule other than schedule I. DEA recently transferred Marinol<sup>[reg]</sup> from schedule II to schedule III, thereby lessening the CSA regulatory requirements governing its use as medicine. See 64 FR 35928 (1999).

[3] 21 U.S.C. 823(f); 21 CFR 5.10(a)(9), 1301.18, 1301.32.

[4] In enacting the CSA, Congress

stated: "The illegal importation, manufacture, distribution, and possession and improper use of controlled substances have a substantial and detrimental effect on the health and general welfare of the American people." 21 U.S.C. 801(2).]

Where, however, a schedule I controlled substance is contained in a product not used for human consumption, the CSA provides DEA with discretionary authority to issue regulations exempting such product from control.<sup>[5]</sup> DEA has carefully considered whether it is appropriate to exercise this discretionary authority when it comes to industrial "hemp" products (i.e., products made from portions of the cannabis plant excluded from the CSA definition of marijuana). The text of the CSA and its legislative history make no mention of industrial uses of the cannabis plant. However, DEA has taken into account that, under prior legislation (the Marihuana Tax Act of 1937), Congress intended to permit the use of certain cannabis-derived industrial products. The Senate Report accompanying the 1937 Act stated:

[5] See 21 U.S.C. 811(g)(3); see also 21 U.S.C. 871(b) (providing discretionary authority to DEA Administrator to "promulgate and enforce any rules, regulations, and procedures which he may deem necessary and appropriate for the efficient execution of his functions under [the CSA].").]

The [cannabis] plant \* \* \* has many industrial uses. From the mature stalks, fiber is produced which in turn is manufactured into twine, and other fiber products. From the seeds, oil is extracted which is used in the manufacture of such products as paint, varnish, linoleum, and soap. From hempseed cake, the residue of the seed after the oil has been

extracted, cattle feed and fertilizer are manufactured. In addition, the seed is used as a special feed for pigeons.

S. Rep. No. 900, 75th Cong., 1st Sess., at 2-3 (1937). DEA recognizes that the intent of Congress in 1937 to allow the foregoing industrial “hemp” products is no longer controlling because the CSA (enacted in 1970) repealed and superseded the 1937 Marihuana Tax Act. DEA further recognizes that the allowance that Congress made for such products under the now-rescinded Marihuana Tax Act was based on a 1937 assumption (now refuted) that such products contained none of the psychoactive drug now known as THC. (In contrast, when Congress enacted the CSA in 1970, it expressly declared that anything containing THC is a schedule I controlled substance.)<sup>[6]</sup> Still, for the reasons provided below, DEA believes it is an appropriate exercise of the Administrator’s discretionary authority under the CSA to issue an exemption allowing the legitimate industrial uses of “hemp” that were allowed under the 1937 Act. At the same time, DEA has been careful to ensure that this exemption comports with the CSA by maintaining the rule that no humans may lawfully take THC into their bodies except when they are (i) using an FDA-approved drug product or (ii) the subjects of FDA-authorized research.

[6] A detailed comparison of the 1937 Marihuana Tax Act and the CSA is provided in the October 9, 2001 interpretive rule. 66 FR at 51530-51531.]

DEA may not arbitrarily exempt a controlled substance from application of the CSA. Rather, such an exemption must be based on a provision of the CSA. As cited above, the exemption of certain “hemp” products under this final rule is issued pursuant to two CSA

provisions: 21 U.S.C. 811(g)(3)(B) and 871(b).

Pursuant to 811(g)(3)(B), the Administrator of DEA may exempt from control “[a] compound, mixture, or preparation which contains any controlled substance, which is not for administration to a human being or animal, and which is packaged in such form or concentration, or with adulterants or denaturants, so that as packaged it does not present any significant potential for abuse.” This provision, which was added to the CSA in 1984, was aimed primarily at analytic standards and preparations which are not for use in humans and pose no significant abuse threat by nature of their formulation. It bears emphasis, however, that Congress did not mandate that DEA exempt from control all mixtures and preparations that DEA determines meet the criteria of section 811(g)(3)(B). Rather, as the word “may” in the first line of section 811(g)(3) indicates, Congress gave DEA discretionary authority to issue such exemptions.

The DEA regulation that implements section 811(g)(3)(B) is 21 CFR 1308.23. Section 1308.23(a) provides that the Administrator may exempt from control a chemical preparation or mixture containing a controlled substance that is “intended for laboratory, industrial, educational, or special research purposes and not for general administration to a human being or other animal” if it is packaged in such a form or concentration, or with adulterants or denaturants, so that the presence of the controlled substance does not present any significant potential for abuse.

DEA believes that industrial “hemp” products such as paper, clothing, and rope, when used for legitimate industrial purposes (not for human consumption) meet the criteria of section 811(g)(3)(B) and Sec. 1308.23. Legitimate use of

such products cannot result in THC entering the human body.

Moreover, allowing these products to be exempted from CSA control in no way hinders the efficient enforcement of the CSA.

Accordingly, DEA believes that these types of industrial products should be exempted from application of the CSA, provided they are not used, or intended for use, for human consumption. For the same reasons, processed cannabis plant materials that cannot readily be converted into any form that can be used for human consumption, and which are used in the production of such legitimate industrial products, are being exempted from control under this final rule.

The use of sterilized cannabis seeds<sup>[7]</sup> that contain THC in animal feed fails to meet the criteria of section 811(g)(3)(B) and section 1308.23 because this involves the use of a controlled substance (THC) in animals.<sup>[8]</sup> Nonetheless, pursuant to 21 U.S.C. 871(b), DEA believes it is appropriate to exempt from application of the CSA animal feed mixtures containing such seeds, provided the seeds are mixed with other ingredients that are not derived from the cannabis plant in a formulation designed, marketed and distributed for animal consumption (not for use in humans). Section 871(b) authorizes the Attorney General to promulgate and enforce any rules, regulations, and procedures which he may deem necessary and appropriate for the efficient enforcement of his functions under the CSA. It should be underscored that section 871(b) is not a catchall provision that can be used to justify any exemption. For the following reasons, however, DEA believes that the use of sterilized cannabis seeds in animal feed mixtures is a unique situation that warrants an exemption pursuant to section 871(b).



[7] Unless otherwise indicated, all references in this document to “cannabis seeds” or “‘hemp’ seeds” refer to sterilized seeds (incapable of germination). In contrast to sterilized cannabis seeds, unsterilized cannabis seeds fit within the CSA definition of marijuana and are not exempted from control under this interim rule.

[8] If, however, the “hemp” seeds used in animal feed are sterilized cannabis seeds that contain no THC, such seeds are not a controlled substance. Under such circumstances, there is no need to exempt such seeds from control.]

As stated above and in the interpretive rule, the legislative history of the 1937 Marihuana Tax Act reveals that Congress expressly contemplated allowing “hemp” animal feed. The 1937 Congress categorized such use of “hemp” as a legitimate “industrial” use. It is true that the intent of the 1937 Congress is no longer controlling since the CSA repealed the 1937 Act and declared anything containing THC to be a schedule I controlled substance. However, because neither the text nor the legislative history of the CSA addresses the legality of using sterilized cannabis seeds in animal feed, or the possibility that such seeds might contain THC, what was viewed under the 1937 Act as “legitimate industrial use” of such seeds in animal feed continued uninterrupted following the enactment of the CSA in 1970.

The historical lack of federal regulation of some THC-containing products (whether based on differences between prior law and the CSA, lack of awareness of the THC content of such product, or other considerations) does not--by itself--justify exempting such product from control under the CSA. DEA remains obligated to apply the provisions of the CSA to all controlled substances absent a

statutory basis to exempt a particular substance from control. However, with respect to animal feed mixtures containing sterilized cannabis seeds, additional factors (combined with Congress' express desire under prior legislation to allow such products) justify an exemption pursuant to section 871(b). The presence of a controlled substance in animal feed poses less potential for abuse than in a product intended for human use and does not entail the administration of THC to humans. Moreover, when sterilized cannabis seeds are mixed with other animal feed ingredients and not designed, marketed, or distributed for human use, there is minimal risk that they will be converted into a product used for human consumption. Therefore, such legitimate use in animal feed mixtures poses no significant danger to the public welfare. Accordingly, given the unique circumstances and history surrounding the use of sterilized cannabis seeds in animal feed, DEA believes that it comports with the CSA to continue to treat such activity as a legitimate industrial use--not subject to CSA control--provided the foregoing conditions are met.

#### **How Is “Human Consumption” Defined Under This Rule?**

Under this final rule, a material, compound, mixture, or preparation containing THC will be considered “used for human consumption” (and therefore not exempted from control) if it is: (I) Ingested orally or (ii) applied by any means such that THC enters the human body. A material, compound, mixture, or preparation containing THC will be considered “intended for use for human consumption” and, therefore, not exempted from control if it is: (i) Designed by the manufacturer for human consumption; (ii) marketed for human consumption; or (iii) distributed, exported, or imported

with the intent that it be used for human consumption.

In any legal proceeding arising under the CSA, the burden of going forward with the evidence that a material, compound, mixture, or preparation containing THC is exempt from control pursuant to this rule shall be upon the person claiming such exemption. 21 U.S.C. 885(a)(1). In order to meet this burden with respect to a product or processed plant material that has not been expressly exempted from control by the Administrator pursuant to 21 CFR 1308.23 (as explained below under the heading “What Is the Control Status of Personal Care Products Made from ‘Hemp’?”), the person claiming the exemption must present rigorous scientific evidence, including well-documented scientific studies by experts trained and qualified to evaluate the effects of drugs on humans.

#### **How Are “Processed Plant Material” and “Animal Feed Mixture” Defined Under This Rule?**

Under this final rule, any portion of the cannabis plant excluded from the CSA definition of marijuana will be considered “processed plant material” if it has been subject to industrial processes, or mixed with other ingredients, such that it cannot readily be converted into any form that can be used for human consumption. For example, fiber that has been separated from the mature stalks by retting for use in textiles is considered processed plant material, which is exempted from control, provided it is not used, or intended for use, for human consumption. In comparison, mature stalks that have merely been cut down and collected do not fit within the definition of “processed plant material” and, therefore, are not exempted from control. As another example, if a

shampoo contains oil derived from sterilized cannabis seeds, one would expect that, as part of the production of the shampoo, the oil was subject to industrial processes and mixed with other ingredients such that, even if some THC remains in the finished product, the shampoo cannot readily be converted into a product that can be consumed by humans. Under such circumstances, the product is exempted from control under this final rule. In comparison, a personal care product that consists solely of oil derived from cannabis seeds does not meet the definition of “processed plant material” under this final rule and, therefore, is not exempted from control.

“Animal feed mixture” is defined under this final rule to mean sterilized cannabis seeds mixed with other ingredients in a formulation that is designed, marketed, and distributed for animal consumption (and not for human consumption). For example, sterilized cannabis seeds mixed with seeds from other plants and for sale in pet stores fit within the definition of “animal feed mixture” and are exempted from control under this final rule provided the feed mixture is not used, or intended for use, for human consumption. (In contrast, a container of pure sterilized cannabis seeds--mixed with no other ingredients--does not meet the definition of “animal feed mixture” under this final rule and, therefore, is not exempted from control.)

### **Which “Hemp” Products Are Exempted From Control Under This Rule?**

It is impossible to list every potential product that might be made from portions of the cannabis plant excluded from the definition of marijuana. Therefore, DEA cannot provide an exhaustive list of “hemp” products that are exempted from control under this final rule. Nonetheless, in order to provide

some guidance to the public, the following are some of the more common “hemp” products that are exempted (noncontrolled) under this final rule, provided they are not used, or intended for use, for human consumption: paper, rope, and clothing made from fiber derived from cannabis stalks, industrial solvents made with oil from cannabis seeds, and bird seed containing sterilized cannabis seed mixed with seeds from other plants (or other ingredients not derived from the cannabis plant). Personal care products (such as lotions and shampoos) made with oil from cannabis seeds are also generally exempted, as explained below.

### **Which “Hemp” Products Are Not Exempted From Control Under This Rule?**

Other than those substances that fit within the exemption being issued in this final rule, all other portions of the cannabis plant, and products made therefrom, that contain any amount of THC are schedule I controlled substances.

Again, because one cannot list every conceivable “hemp” product, it is impossible to examine here every “hemp” product for a determination of whether such product is used, or intended for use, for human consumption within the meaning of this final rule. Therefore, this document contains no exhaustive list of “hemp” products that are not exempted from control under this final rule. Nonetheless, to provide some guidance, the following are some of the “hemp” products that are not exempted from control under this final rule (and therefore remain controlled substances) if they contain THC: any food or beverage (such as pasta, tortilla chips, candy bars, nutritional bars, salad dressings, sauces, cheese, ice cream, and beer) or dietary supplement.

### **What Is the Control Status of**

### **Personal Care Products Made From “Hemp”?**

DEA has not conducted chemical analyses of all of the many and varied personal care products that are marketed in the United States, such as lotions, moisturizers, soaps, or shampoos that contain oil from sterilized cannabis seeds. Indeed, it appears that there is no reliable source of information on these products. Accordingly, DEA does not know whether every personal care product that is labeled a “hemp” product necessarily was made using portions of the cannabis plant, and if so, whether such portions of the plant are those excluded from the definition of marijuana. Even if one assumes that a product that says “hemp” on the label was made using cannabis seeds or other portions of the plant, one cannot automatically infer, without conducting chemical analysis, that the product contains THC.<sup>9</sup> Assuming, however, that a “hemp” product does contain THC, and assuming further that such product is marketed for personal care (e.g., body lotion or shampoo), the question remains whether the use of the product results in THC entering the human body. DEA is unaware of any scientific evidence that definitively answers this question. Therefore, DEA cannot state, as a general matter, whether “hemp” personal care products are exempted from control under this final rule. Nonetheless, given the information currently available, DEA will assume, unless and until it receives evidence to the contrary, that most personal care products do not cause THC to enter the human body and, therefore, are exempted under this final rule. For example, DEA assumes at this time that lotions, moisturizers, soaps, and shampoos that contain oil from sterilized cannabis seeds meet the criteria for exemption under this final rule because they do not cause THC to

enter the human body and cannot be readily converted for human consumption. However, if a personal care “hemp” product is formulated and/or designed to be used in a way that allows THC to enter the human body, such product is not exempted from control under this final rule.

[9] Any product that (i) is made from portions of the cannabis plant excluded from the CSA definition of marijuana and (ii) contains no THC (nor any other controlled substance) is not a controlled substance.]

Again, it must be emphasized that, although DEA believes that most personal care “hemp” products currently marketed in the United States meet the criteria for exemption under this final rule, it is not possible for DEA to provide an exhaustive list of every such product and to state whether such product is exempted. Should manufacturers, distributors, or importers of “hemp” personal care products wish to have their products expressly exempted from control, they should take steps to determine whether such products contain THC and, if they do contain THC, whether use of the products results in THC entering the human body. Any such manufacturer, distributor, or importer who believes that its product satisfies the criteria for exemption under this final rule may request that DEA expressly declare such product exempted from control by submitting to DEA an application for an exemption, together with appropriate scientific data, in accordance with the procedures set forth in 21 CFR 1308.23(b) and (c).

A manufacturer, distributor, or importer of a “hemp” product that meets the criteria for exemption under this final rule need not obtain an express exemption from DEA in order to continue to handle such product. Rather, this is a voluntary procedure. DEA leaves it to the

individual manufacturer, distributor, or importer to decide whether there is sufficient uncertainty about its product to seek an express exemption from DEA. However, any person who continues to handle a “hemp” product that does not meet the criteria for an exemption under this final rule is subject to liability under the CSA.

#### **What Is the Legal Status of “Hemp” Products That Contain No THC?**

Any portion of the cannabis plant, or any product made therefrom, or any product that is marketed as a “hemp” product, that is both excluded from the definition of marijuana and contains no THC--natural or synthetic--(nor any other controlled substance) is not a controlled substance. Accordingly, such substances need not be exempted from control under this final rule, since they are, by definition, noncontrolled.

#### **What Is the Justification for Issuing the Exemptions Under This Rule?**

DEA believes it is both necessary for the most effective enforcement of the CSA and consistent with the public interest to allow the exemptions contained in this rule. Otherwise, as provided in the CSA and DEA regulations, all products containing any amount of THC are schedule I controlled substances. In other words, in the absence of this final rule, legitimate industrial “hemp” products such as paper, rope, clothing, and animal feed mixtures would be schedule I controlled substances if they contain THC. Thus, without the exemptions that are being finalized in this rule, anyone who sought to import such products for legitimate industrial uses would need to obtain a DEA registration and an import permit. 21 U.S.C. 952(a)(2), 957(a). Likewise, distributors of such

products would need a DEA registration and would be required to utilize DEA order forms and maintain strict records of all transactions. 21 U.S.C. 822(a)(1), 827(a), 828(a). DEA believes that such regulatory requirements are unnecessary to protect the public welfare and achieve the goals of the CSA, provided such products are not used, or intended for use, for human consumption. Furthermore, DEA believes that it would not be an appropriate prioritization of limited agency resources to take on the responsibility of regulating these products as schedule I controlled substances when they are not being used for human consumption. Therefore, as long as there is no possibility that humans will consume THC by using something other than an FDA-approved drug product or a product that the FDA has authorized for clinical research, DEA believes that it is consistent with the purposes and structure of the CSA to exempt industrial “hemp” products, processed plant materials, and animal feed mixtures in the manner specified in this final rule.

#### **What Are the Registration Requirements for Handlers of “Hemp” Products Under This Final Rule?**

In light of the exemptions provided under this rule, the following registration requirements should be considered:

Who must obtain a registration--Persons who wish to manufacture or distribute any THC-containing product or plant material that is not exempted from control under this rule must apply for the corresponding registration to handle a schedule I controlled substance. Absent such registration, it is unlawful to manufacture, distribute, or dispense, import, or export any such product or plant material. 21

U.S.C. 822(b), 841(a)(1), 957(a), 960(a). The circumstances under which DEA may grant registrations to handle schedule I controlled substances are limited, as set forth in 21 U.S.C. 823.

In addition, no person may cultivate the cannabis plant for any purpose except when expressly registered with DEA to do so. This has always been the case since the enactment of the CSA. 21 U.S.C. 822(b), 823(a); 21 CFR Part 1301; see *New Hampshire Hemp Council, Inc. v. Marshall*, 203 F.3d 1 (1st Cir. 2000). Further, the CSA prohibits the importation of schedule I controlled substances except as authorized by 21 U.S.C. 952(a)(2). Similarly, the CSA prohibits the exportation of schedule I nonnarcotic controlled substances except as authorized by 21 U.S.C. 953(c).

Who need not obtain a registration--Persons who import and distribute "hemp" products and processed cannabis plant material that are exempted from control under this final rule are not subject to any of the CSA requirements, including the requirement of registration. For example, a person who imports "hemp" clothing is not considered to be importing a controlled substance and is, therefore, not subject to any of the CSA requirements. Similarly, a person who has imported into the United States processed cannabis plant material that is exempted under this rule (such as retted fiber) and converts such material into an exempted "hemp" product (such as clothing) is not considered to be manufacturing a controlled substance and, therefore, need not obtain a controlled substance manufacturing registration.

It is worth repeating here that, if a product marketed as a "hemp" product actually contains no THC (or any other controlled substance), it is noncontrolled and handlers of the product are not subject to any of the CSA provisions, such as the

registration requirement.

### **Comments That DEA Received in Response to the Interim Rule**

Following publication of the interim rule, DEA received comments from thousands of individuals and groups. The comments were in the form of original letters, form letters, petitions, and a cookbook. Those who submitted comments included companies that manufacture and distribute various "hemp" products, associations that represent such manufacturers and distributors, domestic and Canadian government officials, and individuals. In accordance with the Administrative Procedure Act, DEA carefully considered all of the comments it received.

Most of the comments that DEA received relate to both of the rules that DEA published on October 9, 2001: (i) DEA 205 (66 FR 51535), a proposed rule, which proposed to clarify that the listing of THC includes both natural and synthetic THC and (ii) DEA 206 (66 FR 51539), an interim rule, which exempted certain THC-containing products and plant materials from control. Those comments that DEA received which pertain primarily to the interim rule are addressed here. Those comments which pertain primarily to the proposed rule are addressed in the final DEA 205 rule, which appears in a separate **Federal Register** document that immediately precedes this document. Both DEA 205 and DEA 206 contain a summary of the pertinent comments, along with an explanation of how DEA considered them in deciding to finalize the rules.

The number of individuals and groups that participated in the comment process far exceeded the number of different issues raised. The issues raised overlapped to a large extent as many persons submitted form letters or signed

petitions written by groups which themselves submitted lengthy comments. In this document, together with the final proposed rule, DEA has addressed all the major issues raised by the commenters. Some of these issues are addressed above in the text that precedes this section. The remaining issues are addressed below.

### *Comments Regarding Which Products To Exempt From Control*

None of the commenters objected to the basic purpose of this rule: To exempt from control certain THC-containing industrial products and animal feed mixtures made from "hemp" (portions of the cannabis plant excluded from the definition of marijuana). To the contrary, all the commenters who expressed an opinion on this particular issue agreed with these exemptions.<sup>[10]</sup> However, many commenters said that DEA should go further by also exempting "hemp" food and beverage products that contain THC. DEA declined to adopt this suggestion for the reasons provided herein.

[10] Some commenters were under the mistaken impression that DEA failed to exempt any products from control. These commenters asked DEA to exempt what DEA had already exempted under the interim rule. For example, several commenters objected to DEA's supposed failure to exempt "hemp" clothing and paper, even though the interim rule stated repeatedly that such products were being exempted.]

Those commenters who requested that DEA exempt THC-containing "hemp" food and beverage products made two main claims in support of this request: (i) That "hemp" foods and beverages contain only minimal amounts of THC, which, they

asserted, cannot cause any psychoactive effects; and (ii) that the oil from “hemp” seeds (sterilized cannabis seeds) provides nutritional value and is a safe food ingredient.\11\

\11\ Some commenters also expressed concern about the economic impact of disallowing THC-containing “hemp” food and beverage products. This issue is addressed in the final 205 rule, in the regulatory certifications.]

As to the issue of THC content, many of the comments appeared to be asking DEA simply to assume that the placement of the word “hemp” on the label of a food or beverage product automatically means that the product contains a certain low amount of THC. In fact, the existence of the word “hemp” on the label of a food container provides no definitive proof of its contents. The FDA cannot and does not evaluate the contents of every food product sold in the United States. Since there is no reliable information about the contents of all foods and beverages marketed as “hemp” products, it cannot automatically be assumed that all such products will never cause a psychoactive effect or a positive drug test for THC.

One scientific study published in 1997 examined “hemp” salad oil (containing oil from cannabis seeds) sold in “hemp shops” and health food stores in Switzerland. The authors of the study stated that all the human subjects who ate the cannabis seed oil reported THC-specific psychotropic symptoms and had urine samples positive for THC.\12\ In citing this study, DEA is not suggesting that all “hemp” food and beverage products cause psychoactive effects. Rather, DEA mentions this study in response to the assertions made by some commenters that eating “hemp” foods cannot possibly cause psychoactive effects.\13\

\12\ T. Lehman, Institute of Pharmacy, University of Bern, et al., Excretion of Cannabinoids in Urine after Ingestion of Cannabis Seed Oil, *Journal of Analytical Toxicology*, vol. 21 (September 1997).

\13\ In a later study, financed by various “hemp” companies, human subjects were given oil from cannabis seeds containing lower doses of THC than in the Lehman study. G. Leson, et al., Evaluating the Impact of Hemp Food Consumption on Workplace Drug Tests, *Journal of Analytical Toxicology*, vol. 25 (November/December 2001). The authors of this study reported that ingestion of cannabis seed oil containing these lower doses of THC resulted in little or no positive screening for THC, depending on the amount of THC consumed and the sensitivity of the urine testing. Companies who financed this study assert that the lower THC content given to the subjects of this study is commensurate with the current methods employed by these companies for cleaning the cannabis seeds before removing the oil from them for use in food products.]

Attached to one of the comments was another study, which was also financed by various “hemp” companies. This study, entitled “Assessment of Exposure to and Human Health Risk from THC and other cannabinoids in hemp foods,” reached similar conclusions about the reduced levels of THC in currently marketed “hemp” foods and the diminished likelihood of testing positive for THC when consuming such products.

As for the comments claiming that “hemp” foods provide essential nutrients and are safe to eat, it is not DEA's role under the CSA to assess the nutritional value or safety of foods.\14\ Regardless of whether the oil from cannabis seeds contains certain nutrients,\15\ the CSA does

not provide for DEA to exempt food products that contain THC. As explained above and in the text accompanying the interim rule, the CSA prohibits human consumption of “any quantity” of a schedule I hallucinogenic substance outside of an FDA-approved product or FDA-approved research. Other than drugs that have been approved by the FDA for prescription use, or drugs that may be lawfully sold over the counter without a prescription, DEA may not exempt controlled substances to allow them to be used for human consumption--even in the case of products that supposedly contain only “trace amounts” of a controlled substance. 21 U.S.C. 811(g). Thus, DEA may not, as some commenters proposed, pick an arbitrary cutoff line allowing a certain percentage of THC in foods and beverages. Moreover, notwithstanding the statutory prohibition, DEA believes it would be inappropriate to attempt to establish an acceptable level of schedule I hallucinogens in food products. For example, it would not be appropriate to allow food products to contain “trace amounts” of such other schedule I hallucinogens as LSD or MDMA (“ecstasy”). Finding that it is contrary to the public welfare to allow human consumption of “any quantity” of schedule I hallucinogens, Congress did not give DEA the authority to determine what constitutes a “safe amount” of such drugs in food.\16\

\14\ In the context of the CSA, the public “safety” (and DEA's role therein) is implicated by the use of controlled substances for other than a legitimate medical purpose or in any other manner not authorized by the CSA.

\15\ Although this rule is not a food safety measure, because DEA received so many comments regarding this issue, some members

of the public may be interested in the following information. Under the Federal Food, Drug, and Cosmetic Act, a substance that is added to food is not subject to the requirement of premarket approval if its safety is generally recognized among qualified scientific experts under the conditions of its intended use. 21 U.S.C. 321(s). A substance added to a food may be considered “generally recognized as safe” (GRAS) through experience based on “common use in food,” which requires a substantial history of consumption for food use by a significant number of consumers. 21 CFR 170.3(f), (h); 21 CFR 170.30. The FDA evaluated an industry submission claiming GRAS status for certain food uses of “hempseed oil” and expressly stated that it did not believe the submission provided a sufficient basis to classify “hempseed oil” as GRAS through experience based on common use in food. See FDA Center for Food Safety & Applied Nutrition, Office of Premarket Approval, Agency Response Letter, GRAS Notice No. GRN 00035 (August 24, 2000), reproduced at [www.cfsan.fda.gov/rdb/opa-g035.html](http://www.cfsan.fda.gov/rdb/opa-g035.html). In making this determination, the FDA did not evaluate whether there would be a basis for GRAS status through scientific procedures or whether “hempseed oil” would meet the standard for premarket approval as a food additive. *Id.*

[16] To establish a violation of the CSA, the government does not have to prove that the controlled substance in question was of sufficient quantity to produce a psychoactive effect. *United States v. Nelson*, 499 F.2d 965 (8th Cir. 1974).]

Accordingly, DEA has limited the exemptions provided in this final rule to those cannabis-derived “hemp” products that do not cause THC to enter the human body.

### *Comments Regarding Testing Methods To Evaluate THC Content of Foods and Beverages*

Many commenters asked the agency to indicate how it will determine whether a food or beverage product contains THC. Under federal law, it is legally sufficient to demonstrate a violation of the CSA based on the presence of any measurable amount of a prohibited controlled substance.[17] Thus, the questions raised by the commenters are: “What testing methods will DEA utilize to determine whether a food product contains a measurable amount of THC and how sensitive are such methods?”

[17] See, e.g., *United States v. Holland*, 884 F.2d 354, 357 (8th Cir. 1989), cert. denied, 493 U.S. 997 (1989); see also 21 U.S.C. 812(c), schedule I(c) (listing “any material, compound, mixture, or preparation, which contains any quantity” of hallucinogenic substances in schedule I).]

DEA will utilize testing assays or protocols used in standard analytical laboratories that have demonstrated valid and reliable sensitivity for the measurements of THC.[18] The methodology, level of sensitivity, and degree of testing accuracy in the fields of analytical and forensic chemistry have evolved since the first discovery of THC in the 1960s. A variety of analytical equipment, testing methodologies, and protocols are described in the published scientific literature.[19] Such methods may include (but are not limited to) gas chromatography, liquid chromatography, and mass spectrometry analyses. DEA has not, and will not, utilize any one method to the exclusion of others.[20]

[18] In this context, “valid” means that the technique measures what it is designed to measure, and

“reliable” means that the technique can be replicated by other laboratories.

[19] See, e.g., M.V. Doig & R. Andela, Analysis of pharmacologically active cannabinoids by GC-MS, *Chromatographia* 52 (Supp.): S101-S102 (2000); P.D. Felgate & A.C. Dinan, The determination of delta-9-tetrahydrocannabinol and 11-Nor-9-carboxy-delta-9-tetrahydrocannabinol in whole blood using solvent extraction combined with polar solid-phase extraction, *Journal of Analytical Toxicology* 24:127-132 (2000); K. Ndjoko, et al., Analysis of cannabinoids by liquid chromatography-thermospray mass spectrometry and liquid chromatography-tandem mass spectrometry, *Chromatographia* 47:72-76 (1998); B.J. Gudzinowicz & M.J. Gudzinowicz, Analysis of drugs and metabolites by gas chromatography-mass spectrometry, Volume 7: Natural, pyrolytic, and metabolic products of tobacco and marijuana, NY: Marcel Dekker, Inc. (1980).

[20] What constitutes the appropriate method of testing may vary depending on the circumstances. In any criminal prosecution, civil or administrative action, or other legal proceeding arising under the CSA, where the government must prove the presence of a controlled substance, the government may do so by the introduction of any evidence sufficient under law to prove such fact. See, e.g., *United States v. Bryce*, 208 F.3d 346, 352-354 (2d Cir. 2000).]

The lower limit of detectability of these assays can vary according to equipment, methodologies, and the form of the sample. Nonetheless, using currently available analytical methodologies and extraction procedures, it is



reasonable to reproducibly and accurately detect THC at or below 1 part per million in cannabis bulk materials or products. Should more sensitive assays and analytical techniques be developed in the future, DEA will refine its testing methods accordingly.

Some companies that handle “hemp” food products have asked DEA whether the agency would test the companies’ products for THC content. It is not within DEA’s authority to serve as such a testing laboratory for private entities. Nor would it be appropriate for DEA to certify laboratories for these analyses. Manufacturers and distributors of “hemp” food and beverage products may, of course, conduct their own testing to determine to their own satisfaction that their products contain no THC. However, they are under no obligation to do so. Whether or not they conduct such testing, the law remains the same: if a food or beverage product contains any measurable amount of THC, it is an illegal schedule I controlled substance; if it contains no THC, it is a legal, noncontrolled substance.

#### *Comments Regarding Drug Screening*

Several commenters asserted that, in deciding whether or not to exempt THC-containing food and beverage products, DEA should not concern itself with the possibility that persons who eat such products then undergo drug screening might test positive for THC. Some of these commenters suggested that “hemp” food and beverage manufacturers have taken steps to ensure that the amount of THC in their products is low enough to avoid causing a positive drug screen. Given these comments, it must be emphasized that, while effective drug screening in appropriate circumstances is of concern to DEA and was part of the agency’s overall consideration, the

ultimate decision about which products to exempt from control did not turn on drug testing considerations. Rather, as explained above, DEA exempted certain products to the extent permissible by the CSA and consistent with the public welfare within the meaning of the Act.

Although drug testing was not the basis for the exemptions, in view of the comments about drug testing, it is worth reiterating that there are no uniform standards of what constitutes a “hemp” product. It cannot be said that, merely because a product has the word “hemp” on the label, it will necessarily contain a certain low amount of THC. Therefore, it cannot automatically be said that a food or beverage product marketed as containing “hemp” will never cause a positive drug test for THC. In fact, as noted above, one published scientific study found that eating “hempseed” salad oil (of a variety sold in “hemp shops” in Switzerland) did cause human research subjects to test positive for THC.

#### *Comments Regarding the Cultivation of Cannabis for Industrial Purposes*

Some commenters asserted that the United States should promote the cultivation of cannabis for industrial purposes based on economic and environmental considerations. These commenters seemed to misunderstand the nature of the rules being finalized today. The rules do not impose restrictions on, or even address, the cultivation of cannabis. Rather, as the text accompanying the rules makes clear, the rules clarify which cannabis-derived products are controlled and which are exempted from control.

As stated above, it has always been the case since the enactment of the CSA in 1970 that any person who seeks to lawfully grow cannabis for any purpose (including

the production of “hemp” for industrial purposes) must obtain a DEA registration. This requirement remains in effect and is not modified by the rules DEA is finalizing today.

#### **Regulatory Certifications**

##### *Economic Impact of This Rule*

This rule allows economic activity that would otherwise be prohibited. As has now been made clear under the DEA regulations being finalized today, all products that contain any amount of THC are schedule I controlled substances unless they are specifically listed in another schedule or exempted from control. Thus, without the exemptions provided in this final rule, industrial “hemp” products such as paper, rope, clothing, and animal feed would be subject to the provisions of the CSA and DEA regulations that govern schedule I controlled substances if they contained THC. The CSA permits the use of schedule I controlled substances for industrial purposes, but only under strictly regulated conditions. By virtue of this rule, however, most industrial “hemp” products are exempt from all provisions of the CSA and DEA regulations. Thus, this rule imposes no regulatory restrictions on any economic activities; rather, it removes regulatory restrictions on certain economic activities.

##### *Regulatory Flexibility Act*

For the reasons provided in the foregoing paragraph, the Acting Administrator hereby certifies that this rule will not have a significant impact on a substantial number of small entities within the meaning of the Regulatory Flexibility Act (5 U.S.C. 605(b)). Therefore, a final regulatory flexibility analysis is not required for this final rule.

*Executive Order 12866*

This rule has been drafted and reviewed in accordance with Executive Order 12866, Regulatory Planning and Review, section 1(b), Principles of Regulation. This rule has been determined to be a “significant regulatory action” under Executive Order 12866, section 3(f). Accordingly, this rule has been reviewed by the Office of Management and Budget for purposes of Executive Order 12866.

#### *Executive Order 13132*

This rule does not preempt or modify any provision of state law; nor does it impose enforcement responsibilities on any state; nor does it diminish the power of any state to enforce its own laws. Accordingly, this rule does not have federalism implications warranting the application of Executive Order 13132.

#### *Executive Order 12988--Civil Justice Reform*

This rule meets the applicable standards set forth in sections 3(a) and 3(b)(2) of Executive Order 12988.

#### *Unfunded Mandates Reform Act of 1995*

This rule will not result in the expenditure by State, local, and tribal governments, in the aggregate, or by the private sector, of \$100,000,000 or more in any one year. Therefore, no actions are necessary under the Unfunded Mandates Reform Act of 1995.

#### *Small Business Regulatory Enforcement Fairness Act of 1996*

This rule is not likely to result in any of the following: An annual effect on the economy of \$100,000,000 or more; a major increase in costs or prices for consumers, individual industries, Federal, state, or local government

agencies, or geographic regions; or significant adverse effects on competition, employment, investment, productivity, innovation, or on the ability of United States-based enterprises to compete with foreign-based enterprises in domestic and export markets. Accordingly, under the Small Business Regulatory Enforcement Fairness Act of 1996 (SBREFA), this is not a major rule as defined in 5 U.S.C. 804. Therefore, the provisions of SBREFA relating to major rules are inapplicable to this rule. However, a copy of this rule has been sent to the Office of Advocacy, Small Business Administration. Further, a copy of this rule will be submitted to each House of the Congress and to the Comptroller General in accordance with SBREFA (5 U.S.C. 801).

#### *Paperwork Reduction Act of 1995*

This rule does not involve collection of information within the meaning of the Paperwork Reduction Act of 1995.

#### **List of Subjects in 21 CFR Part 1308**

Administrative practice and procedure, Drug traffic control, Narcotics, Prescription drugs.

#### **Final Rule**

Pursuant to the authority vested in the Attorney General under sections 201, 202, and 501(b) of the CSA (21 U.S.C. 811, 812, and 871(b)), delegated to the Administrator and Deputy Administrator pursuant to section 501(a) (21 U.S.C. 871(a)) and as specified in 28 CFR 0.100, the Acting Administrator hereby orders that the interim rule amending title 21 of the Code of Federal Regulations, part 1308, to include new Sec. 1308.35, which was published at 66 FR 51539, on

October 9, 2001, is adopted as a final rule without change.

Dated: March 18, 2003.

**John B. Brown III,**

Acting Administrator.

[FR Doc. 03-6805 Filed 3-20-03; 8:45 am]

**BILLING CODE 4410-09-P**

## SELECTED REFERENCES

[Note: Selected references are a compilation of recent publications of presumed interest to forensic chemists. Unless otherwise stated, all listed citations are published in English. If available, the email address for the primary author is provided as the contact information. Listed mailing address information (which is sometimes cryptic or incomplete) exactly duplicates that listed by the abstracting services.]

1. Gilmore S, Peakall R. **Isolation of microsatellite markers in *Cannabis sativa* L. (marijuana).** *Molecular Ecology Notes* 2003;3(1):105. [Editor's Notes: 15 variable microsatellite markers were identified that can characterize genetic diversity in cultivated and natural marijuana populations. Contact: Centre for Forensic Science, Canberra Institute of Technology, Canberra, ACT 2601, Australia.]
2. Kamande MW, Kapnissi CP, Zhu XF, Akbay C, Warner IM. **Open-tubular capillary electrochromatography using a polymeric surfactant coating.** *Electrophoresis* 2003;24(6):945. [Editor's Notes: The title technique was applied to the analysis of benzodiazepines (unspecified in the abstract). Contact: Warner IM, Louisiana State Univ, Dept Chem, Baton Rouge, LA 70803.]
3. Stubberud K, Callmer K, Westerlund D. **Partial filling - micellar electrokinetic chromatography optimization studies of ibuprofen, codeine and degradation products, and coupling to mass spectrometry: Part II.** *Electrophoresis* 2003;24(6):1008. [Editor's Notes: The presented technique is suitable for analysis of pharmaceutical preparations containing the title compounds. Contact: Stubberud K, AstraZeneca R&D Molndal, Analyt Dev, SE-43183 Molndal, Sweden.]
4. Fang C, Liu JT, Lin CH. **On-line identification of lysergic acid diethylamide (LSD) in tablets using a combination of a sweeping technique and micellar electrokinetic chromatography/77 K fluorescence spectroscopy.** *Electrophoresis* 2003;24(6):1025. [Editor's Notes: Presents and contrasts the title analysis with standard GC/MS methods. Contact: Lin CH, Natl Taiwan Normal Univ, Dept Chem, 88 Sec 4, Tingchow Rd, Taipei, Taiwan.]
5. Huang YS, Liu JT, Lin LC, Lin CH. **Chiral separation of 3,4-methylenedioxymethamphetamine and related compounds in clandestine tablets and urine by capillary electrophoresis/fluorescence spectroscopy.** *Electrophoresis* 2003;24(6):1097. [Editor's Notes: MDA was also analyzed. Contrasts the title analysis with standard GC/MS methods. Contact: Lin CH, Natl Taiwan Normal Univ, Dept Chem, 88 Sec 4, Tingchow Rd, Taipei, Taiwan.]
6. Schneider RC, Kovar KA. **Analysis of ecstasy with a monolithic reverse-phase column.** *Chromatographia* 2003;57(5-6):287. [Editor's Notes: Presents an HPLC method that analyzes for amphetamine, MDMA, MDEA, and N-methyl-1-(3,4-methylenedioxyphenyl)-2-butanamine in suspected ecstasy tablets. Contact: Kovar KA, Univ Tubingen, Inst Pharmaceut Anal, Morgenstelle 8, D-72076 Tubingen, Germany.]
7. CampinsFalco P, VerduAndres J, HerraezHernandez R. **Separation of the enantiomers of primary and secondary amphetamines by liquid chromatography after derivatization with (-)-1-(9-fluorenyl)ethyl chloroformate.** *Chromatographia* 2003;57(5-6):309. [Editor's Notes: Analysis of amphetamine, methamphetamine, ephedrine, pseudoephedrine, MDA, MDMA, and MDE are reported. A variety of sample types (not specified in the abstract) were analyzed. Contact: HerraezHernandez R, Univ Valencia, Dept Analyt Chem, Dr Moliner 50, E-46100

Valencia, Spain.]

8. Zhang JY, Xie JP, Chen XG, Hu ZD. **Sensitive determination of ephedrine and pseudo-ephedrine by capillary electrophoresis with laser-induced fluorescence detection.** Analyst 2003;128(4):369. [Editor's Notes: The title technique was applied to the analysis of ephedra and ephedra preparations. Contact: Hu ZD, Lanzhou Univ, Dept Chem, Lanzhou 730000, Peoples R China.]
9. Kulikowska J, Celinski R, Soja A, Sybirska H. **Investigations on the quality of home-made poppy straw products ("Compote") at the forensic medicine department in Katowice.** Proceedings, 39<sup>th</sup> Annual TIAFT Meeting, Prague, 2001. [Editor's Notes: Illicit production of morphine and heroin in Poland (from poppy straw) is reviewed, and the techniques used for analysis of these products are discussed. Contact: Forensic Medicine Department, Silesian Academy of Medicine, Katowice, Poland.]
10. Bradley D. **Tracking cocaine to its roots.** Today's Chemist at Work 2002;May:15. [Editor's Notes: The Editor was unable to acquire a copy of this article. However, the abstract suggests that it is an overview of the DEA Cocaine Signature Program protocols, which were discussed in an article published in *Nature*. Contact: No address information was provided.]
11. Bakavoli M, Kaykhahi M. **Quantitative determination of diazepam, nitrazepam and flunitrazepam in tablets using thin-layer chromatography - densitometry technique.** Journal of Pharmaceutical and Biomedical Analysis 2003;31(6):1185. [Editor's Notes: Also includes and contrasts HPLC analyses. UV (254 nm) detection was used for both techniques. Contact: Bakavoli M, Ferdowsi Univ, Dept Chem, Fac Sci, Mashhad 91779, Iran.]

#### **Additional References of Possible Interest:**

1. Omran AA, Kitamura K, Takegami S, Kume M, Yoshida M, ElSayed AAY, Mohamed MH, AbdelMottaleb M. **F-19 NMR spectrometric determination of the partition coefficients of some fluorinated psychotropic drugs between phosphatidylcholine bilayer vesicles and water.** Journal of Pharmaceutical and Biomedical Analysis 2002;30(4):1087. [Editor's Notes: The referenced technique was utilized to determine the partition coefficients of trifluoperazine, flunitrazepam, and flurazepam. Contact: K Kitamura, Kyoto Pharmaceut Univ, Yamashita Ku, 5 Nakachi Cho, Kyoto 6078414, Japan.]
2. Wu N, Feng WQ, Lin E, Chen GD, Patel J, Chan TM, Pramanik B. **Quantitative and structural determination of pseudoephedrine sulfate and its related compounds in pharmaceutical preparations using high-performance liquid chromatography.** Journal of Pharmaceutical and Biomedical Analysis 2002;30(4):1143. [Editor's Notes: Several pseudoephedrine degradation products were also identified. Contact: N Wu, Schering Plough Corp, Res Inst, Analyt Div, 2011 Galloping Hill Rd, Kenilworth, NJ 07033.]
3. Mahgoub H, Gazy AA, ElYazbi, ElSayed M, Youssef RM. **Spectrophotometric determination of binary mixtures of pseudoephedrine with some histamine H-1-receptor antagonists using derivative ratio spectrum method.** Journal of Pharmaceutical and Biomedical Analysis 2003;31(4):801. [Editor's Notes: The title technique was applied to mixtures of pseudoephedrine with fexofenadine, cetirizine, or loratidine. Contact: El-Yazbi FA, Univ Alexandria, Fac Pharm, Dept Pharmaceut Analyt Chem, El Messalah 21521, Egypt.]

4. Sherma J, Larkin JD, Larkin FH. **A field guide to instrumentation. Ultraviolet-visible (UV-Vis) spectrometers.** Inside Laboratory Management 2002;7(2):22. [Editor's Notes: Presents a mini-review of theory and use of current UV/Vis spectrometers. Contact: [shermaj@lafayette.edu](mailto:shermaj@lafayette.edu)]
5. Kataoka H. **New trends in sample preparation for clinical and pharmaceutical analysis.** TrAC, Trends in Analytical Chemistry 2003;22(4):232. [Editor's Notes: Includes discussion of sample prep for various forensic samples. Contact: Faculty of Pharmaceutical Sciences, Okayama University, Tsushima, Okayama 700-8530, Japan.]
6. Heimbuck CA, Bower NW. **Teaching experimental design using a GC-MS analysis of cocaine on money: A cross-disciplinary laboratory.** Journal of Chemical Education 2002;79(10):1254. [Editor's Notes: Presents a series of collegiate laboratory experiments to perform the title analyses. Contact: Chemistry Department, Colorado College, Colorado Springs, CO 80903.]
7. Russowsky D, Neto BAD. **A concise and stereoselective synthesis of (+/-)-erythro-methylphenidate.** Tetrahedron Letters 2003;44(14):2923. [Editor's Notes: The title synthesis proceeds through a modified Eschenmoser sulfide contraction. Contact: Russowsky D, Univ Fed Rio Grande Sul, Inst Quim, Av Bento Goncalves 9500, BR-91501970 Porto Alegre, RS, Brazil.]
8. Pirnay S, Ricordel I, Libong D, Bouchonnet S. **Sensitive method for the detection of 22 benzodiazepines by gas chromatography - ion trap tandem mass spectrometry.** J Chromatogr A 2002;954:235. [Editor's Notes: The utility of title method was demonstrated on blood and urine samples. Contact: Departement de Chimie des Mecanismes Reactionnels, Ecole Polytechnique, Route de Saclay, 91128 Palaiseau Cedex, France.]
9. Bent S, Tiedt TN, Odden MC, Shlipak MG. **The relative safety of ephedra compared with other herbal products.** Ann Intern Med 2003;138:(page number not provided). [Editor's Notes: Presents an overview and comparison of ephedra-based versus other herbal products. The results show that ephedra-based products have an overwhelming incidence of adverse effects versus all other herbals. Contact: San Francisco Veterans Affairs Medical Centre, 111-A1, 4150 Clement Street, San Francisco, CA 94121.]

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## THE DEA FY - 2003 STATE AND LOCAL FORENSIC CHEMISTS SEMINAR SCHEDULE

The remainder of the FY - 2003 schedule for the DEA's State and Local Forensic Chemists Seminar is as follows:

September 15 – 19, 2003

Note that the school is open only to forensic chemists working for law enforcement agencies, and is intended for chemists who have completed their agency's internal training program and have also been working on the bench for at least one year. There is no tuition charge for this course. The course is held in Northern Virginia, near the Washington/Dulles International Airport. For additional information, eligibility requirements, or to enroll, see the September 2002 issue of *Microgram Bulletin*, or call 703 668-3337.

## EMPLOYMENT OPPORTUNITIES

### 1. DuPage County Sheriff's Office Crime Laboratory

(First Posting)

**Position:** Forensic Chemist (FS-II)

**Location:** Wheaton, Illinois (34 Miles West of Chicago)

**Salary Range:** \$37,670 - \$71,270 per year (Starting Salary is Negotiable and Commensurate with Experience.)

**Application Deadline:** Open Until Filled

**Duties:** Responsibilities will include the examination and evaluation of scientific evidence; interpretation of laboratory analyses and results; preparation of written reports, and the ability to testify as an expert witness. Ancillary responsibilities include maintenance of laboratory equipment and supplies; management of caseloads, and attendance at workshops and seminars as required.

**General Requirements:** The applicant must be skilled in using gas chromatography, mass spectroscopy, ultraviolet and infrared spectrophotometry and other drug screening equipment, and must be able to work independently. Minimum requirements of the position include, but are not limited to: Bachelor's degree in a natural science; two years of practical working experience in a forensic laboratory including court testimony as an expert witness; and above average knowledge of and ability to apply scientific methods and disciplines of laboratory testing and analysis.

**Application Procedures:** For further information please contact:

John Collins, Laboratory Director  
501 N. County Farm Road  
Wheaton, IL 60187  
Telephone: (630) 682-7198  
Fax: (630) 682-7908  
E-mail: [jcollins@dupageco.org](mailto:jcollins@dupageco.org)

\* \* \* \* \*

### 2. State of Connecticut, Department of Public Safety, Scientific Services Division

(First Posting)

**Position:** Director of Toxicology, Controlled Substances / Toxicology Section

**Location:** Hartford, Connecticut

**Salary Range:** Negotiable

**Application Deadline:** Open Until Filled

**Overview:** The State of Connecticut is offering you that opportunity to create your own vision as Director of the Controlled Substances and Toxicology Laboratory, in the Scientific Services Division, Department of Public Safety, which has one of the most professional and prestigious reputations in the United States. As the Chief Toxicologist, you can focus your energies on directing staff and operations of the laboratory, as administrative responsibilities are shared. Your working environment will be with a highly dedicated and professional staff supported by cutting edge tools and technology.

**Duties:** We are seeking an individual with proven leadership abilities, a passion for research and development, and the ability to complete the laboratory accreditation process. Responsibilities include: Directing staff and scientific operations of a forensic toxicology laboratory; coordinates, plans and manages laboratory programs; formulates program goals and develops laboratory policy; develops and implements techniques necessary to examine chemical and biological evidence; researches new methodology; reviews laboratory findings and supervises report preparation; interprets and administers pertinent laws; trains, supervises and evaluates staff; responds to queries regarding drug effects and chemical actions; serves as expert witness on relevant issues in court cases; and performs related duties as required.

**Qualifications:** A minimum of 10 years experience and training in toxicology and criminalistics in a public health or general toxicology laboratory. Two years of this experience must have been in a supervisory capacity in a major program in forensic toxicology. You must have a comprehensive understanding of the principles and techniques of analytical chemistry (to include infrared and ultra violet spectrophotometry, gas and high performance liquid chromatography, mass spectrometry, and immunoassays). Also, a comprehensive knowledge of the principles of pharmacokinetics and pharmacodynamics is required. Passing an extensive background check is a hiring requirement. The ideal candidate will have a Ph.D. in Toxicology, pharmacology, or related biological or chemical science and will be Board Certified or eligible for Board Certification in Forensic Toxicology.



In addition to a competitive salary, the State of Connecticut total compensation plan includes a generous benefit package worth over 36% of an employees' annual salary. Benefits and options include: A choice of medical and dental plans designed to suit your need, long and short term disability, life insurance, an excellent retirement plan, deferred compensation plan, 12 paid holidays, personal leave days, sick time, and a generous vacation plan. For more information go to: [www.das.state.ct.us](http://www.das.state.ct.us).

**Application Procedures:** Please forward your resume, cover letter and salary requirements to:

Patsy McLaughlin  
Manager of Recruitment  
State of Connecticut  
Department of Administrative Services  
165 Capitol Avenue, R. G-1  
Hartford, CT 06106

\* \* \* \* \*

## SCIENTIFIC MEETINGS

**1. Title:** Annual New England Seminar in Forensic Sciences (Third and Final Posting)  
**Sponsoring Organization:** Colby College, Special Programs  
**Inclusive Dates:** August 10 - 14, 2003  
**Location:** Colby College, Waterville, ME  
**Meeting Registration Procedure, Deadline, and Costs:** [See website]  
**Recommended Lodging (Registration Deadline and Costs):** [See website]  
**Contact Individual's Name, Phone Number, and email Address:** Jesse Davis, 207/872-3386 (FAX -3383),  
[summer@colby.edu](mailto:summer@colby.edu)  
**Website:** [[www.colby.edu/spec.prog/cme.html](http://www.colby.edu/spec.prog/cme.html)]

\* \* \* \* \*

**2. Title:** 3<sup>rd</sup> European Academy of Forensic Science Triennial Meeting (Second Bimonthly Posting)  
**Sponsoring Organization:** European Academy of Forensic Science  
**Inclusive Dates:** September 22 - 27, 2003  
**Location:** Istanbul, Turkey (Istanbul Convention Centre)  
**Meeting Registration Procedure, Deadline, and Costs:** [See website]  
**Recommended Lodging (Registration Deadline and Costs):** [See website]  
**Contact Individual's Name, Phone Number, and email Address:** [No Contact Name Provided, +90 212 287-5800 (FAX 263-4581, [eafs2003@enfsi.org](mailto:eafs2003@enfsi.org))]  
**Website:** [[www.eafs2003.enfsi.org](http://www.eafs2003.enfsi.org)]

\* \* \* \* \*

**3. Title:** Clandestine Laboratory Investigating Chemists Association, 13th Annual Technical Training Seminar (First Posting)  
**Sponsoring Organization:** Clandestine Laboratory Investigating Chemists Association  
**Inclusive Dates:** September 3 - 6, 2003  
**Location:** Richmond, VA (Omni Richmond Hotel)  
**Meeting Registration Procedure, Deadline, and Costs:** [Contact Organizers for Flyer]  
**Recommended Lodging (Registration Deadline and Costs):** [Contact Organizers for Flyer]  
**Contact Individual's Name, Phone Number, and email Address:** Two Contacts listed: 1) Roger Ely, 415/744-7051, [rogely@atdial.net](mailto:rogely@atdial.net); 2) Rick Fortune, 804/786-9637, [rfortune@dfs.state.va.us](mailto:rfortune@dfs.state.va.us)  
**Website:** [None]

# Computer Corner

## Digital Examination Impact

# #171

by Michael J. Phelan  
DEA Digital Evidence  
Laboratory

If there is a constant in the world of forensic science, it is the plea for more resources. The usual justifications typically utilize “shock statements” concerning the dramatic increases of exhibits being submitted for examination and the concomitant rapid increases in evidence backlogs.

Not surprisingly, digital evidence programs are no exception – and in fact, they are often leading the charge on “shock statements”. Currently, submission rates for digital evidence laboratories are growing between 20 and 60 percent per year, and examination backlogs are typically averaging between 2 and 9 months! Even the most limited computer examinations take 3 to 5 days, and in-depth analyses can take 2 to 3 weeks. When compared to most other forensic sciences, digital evidence is a high-pressure and labor-intensive endeavor, with significant operational issues (backlogs, turnaround times, mission creep, etc.) and critical infrastructure problems (lack of examiners, lack of space, continuous need for updated software and hardware, etc.). Alternative solutions such as automation or intelligent software do not appear to offer much promise, at least in the near term.

Not surprisingly, this situation is highly frustrating for management and budget planners. From their perspective, digital evidence programs represent a serious “problem” that (much more often than not) is getting ever-worse despite the ever-increasing input of additional resources. And there’s seemingly no end in sight.

Despite these issues, however, virtually every Federal law enforcement organization, and also many state and local crime laboratories and/or investigative agencies, have established digital evidence programs. Why? The answer is simple: *Results, Results, and more Results*. Management continues to support digital evidence because the tangible benefits derived from the program clearly outweigh its costs and growing pains. And doing nothing is simply not an option.

The recent establishment of the DEA Digital Evidence Laboratory forced DEA management to look at the big picture and evaluate what works, what needs to be improved, and what is the overall impact of the program. As part of this review, a survey of 22 Case Agents that recently (within the last 9 months) had one or more exhibits analyzed by a DEA digital evidence examiner was

conducted. The purpose of the survey was to quantify the value that the examination had in each case. This was not, of course, a broad, scientific sampling. Rather, the interest was in gaining a quick insight into how digital evidence examination results are actually used, and assessing the value of the examinations to the respective cases. The survey was almost equally divided between drug enforcement cases (clandestine laboratory operators, money launderers, drug importers, and drug traffickers) and drug and chemical diversion investigations (doctors, pharmacies, drug manufacturers, wholesalers, and chemical companies).

The findings documented that the examinations made several significant contributions to the cases. In fact, the average number of positive outcomes mentioned by Case Agents was five! Table 1 (next page) lists some of the outcomes and their reported frequency as stated by Agents.

**Table 1: DEA Case Agent Survey Results**

<u>Outcome Mentioned</u>	<u>Frequency</u>
Corroborate Prior Investigative Information	90%
Used As Drug Intelligence	70%
Provided Investigative Leads	70%
Identified Incriminating Information	65%
Verified Informant Statement	60%
Identified Overt Illegal Acts	50%
Identified Trafficker Financial Information	40%
Used in Plea Negotiation	40%
Identified Previously Unknown Co-conspirator	35%

Most importantly, 40% of the Agents reported that the digital evidence examination support was “essential” to their investigation. Another 30% reported the support rendered was “very important”. Overall, 95% of the Agents indicated satisfaction with the support provided by the digital evidence laboratory.

The value of this information is three-fold. First, it formally documents how the digital evidence program supports DEA Agents who are investigating drug cases. Second, it shows how forensic support is particularly well suited for identification of illegal acts, co-conspirators, and trafficker financial assets. Third, the fact that 40% of the Agents indicated that it was “essential” to their case strongly suggests that their cases may have had very different outcomes had it not been for the digital evidence examination.

Different law enforcement organizations would likely have different results from a similar survey of their digital evidence programs. These differences

would reflect the varied nature of crime, and the varied use of digital technologies in illicit activities.

Surveying your “customers” (Case Agents) is a very good idea. The information obtained can assist in making the case (i.e., documenting) that a digital evidence program really does provide value, and justifies the need for additional resources. And it is usually better to accentuate the positive, actual results, versus harping on the gloom and doom of evidence backlogs, or using “shock statements” concerning the incredible numbers of computers, Internet accounts, and electronic consumer devices in the world. The latter numbers are now so large that they have become almost meaningless anyway.

Comments or questions?  
e-mail: [mphelan@erols.com](mailto:mphelan@erols.com)

# Microgram

## *Bulletin*

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**VOL. XXXVI, NO. 7**

**JULY 2003**

**- INTELLIGENCE BRIEF -**

**VERY LARGE PSILOCYBIN MUSHROOMS, PEYOTE CACTI, AND MARIJUANA GROW OPERATION IN GUILDERLAND AND SCOTIA, NEW YORK**

The New York State Police Forensic Investigation Center (Albany, New York) recently received a large polydrug submission consisting of 645 large jars containing growing psilocybin mushroom cultures (see Photo 1), 12 pots with growing peyote cacti, 45 growing marijuana plants, and over 10 pounds of dried psilocybin mushrooms. Growing media, rye grain, hay, mushroom spores, scales, glassware, thermometer, drying racks, firearms, and fireworks were also recovered. The evidence was seized by the Albany County Sheriff's Department from two separate residences in Guilderland and Scotia (suburbs of



**Photo 1**

Albany), that were set up as large-scale indoor grow operations. The spores were purchased from an Internet source [Details not provided in accordance with *Bulletin* policy]. Analysis of the mushrooms by TLC and GC/MS confirmed psilocybin. Analysis of the peyote cacti by GC/MS confirmed mescaline. The marijuana was not analyzed. None of the exhibits were quantitated.

\* \* \* \* \*

**- INTELLIGENCE BRIEF -**

**METHAMPHETAMINE TABLETS WITH THE FERRARI LOGO  
IN LAKE COUNTY, OHIO**

The Lake County Crime Laboratory (Painesville, Ohio) recently received a plastic zip-lock baggie containing 15 red colored tablets with the “Ferrari” logo imprinted on each (See Photo 2). The exhibit was obtained in Mayfield Heights in an undercover purchase by the Mayfield Heights Police Department, and were purported by the seller to be Ecstasy. The tablets measured 8 mm in diameter (width and total net mass not reported). Analysis by GC/MS, however, indicated not MDMA but rather methamphetamine (not quantitated). It appeared that the seller was unaware of the actual composition of the tablets.



**Photo 2**

\* \* \* \* \*

**- INTELLIGENCE BRIEF -**

**COCAINE BRICKS WITH UNICORN AND HORSHOE LOGOS  
IN LOWER CHICHESTER TOWNSHIP, PENNSYLVANIA**

The Pennsylvania State Police Lima Regional Laboratory (Media, Pennsylvania) recently received seven bricks, suspected cocaine, total net mass 7.015 kilograms (approximately 1.0 kilogram/brick). The exhibits were seized from a tractor trailer in Lower Chichester Township (approximately 15 miles south of Philadelphia) during a routine inspection by the Pennsylvania State Police, Media Barracks. Each brick was 9 x 6 x 1.25 inches, white in color, and imprinted with both a unicorn (center) and a horseshoe (upper right corner) logo (see Photo 3). They were multiply packaged in plastic wrap,



**Photo 3**

clear tape, silver foil, black rubber, yellow duct tape, and finally placed in vacuum sealed bags. Analysis by color testing and GC/MS confirmed cocaine (quantitation not performed). This is the first seizure of bricks with this logo in the Lima Laboratory's jurisdiction.

\* \* \* \* \*

#### **- INTELLIGENCE BRIEF -**

##### **N,N-DIPROPYLTRYPTAMINE HCL IN ALLIANCE, OHIO**

The Canton-Stark County Crime Laboratory (Canton, Ohio) recently received a blue vial, labelled as containing 1 gram of "Ultra-Pure N,N-Dipropyltryptamine HCl (DPT)" (apparently a commercial preparation). The exhibit had been submitted by the Stark County Sheriff's Department, pursuant to a drug overdose in Alliance, Ohio. The victim apparently acquired the material via an Internet sale [Details not provided in accordance with *Bulletin* policy]. The vial still contained 0.49 grams of a white powder, which gave a yellow-fading-to-green Marquis test. Analysis by GC/MS and FTIR, confirmed dipropyltryptamine HCl, based on comparisons with spectral libraries. This was the Crime Laboratory's first encounter with this substance.

[Editor's Note: Spectral data (FTIR, <sup>1</sup>H-NMR, MS, and UV/Vis) for dipropyltryptamine are reported in Mills and Roberson, Instrumental Data for Drug Analysis, Second Edition, Volume 1, pps 770-771.]

\* \* \* \* \*

#### **- INTELLIGENCE BRIEF -**

##### **MIXED MDMA/PIPERAZINE TABLETS IN SAN DIEGO, CALIFORNIA**

The DEA Southwest Laboratory (San Diego, California) recently received two exhibits consisting of 200 and 76 blue/green colored tablets, respectively, with an "HO" or "OH" logo, suspected Ecstasy (see Photo 4). The exhibits were seized in San Diego as part of a larger case (details not reported). Both sets of tablets were poorly pressed, round, flat-edged, biconvex, and weighed about 170 milligrams each. Analysis by FTIR and GC/MS, however, indicated not just MDMA but rather a mixture of MDMA, benzyl-piperazine (BZP), N-(3-trifluoromethylphenyl)piperazine (TFMPP), caffeine, probable methoxyphenylpiperazine (isomer not identified, but probably *ortho* (OMPP or MeOPP)), and 3,4-methylenedioxypheyl-2-propanone (MDP2P). The 200 tablet sample quantitated to 12 milligrams of MDMA HCl/tablet, while the 76 tablet sample quantitated to 15 milligrams of MDMA HCl/tablet. The piperazine components were not quantitated. All other sample submissions in this case contained only MDMA.



**Photo 4**



**- INTELLIGENCE BRIEF -**

**MAIL-ORDER PSILOCYBIN MUSHROOM SPORES IN GREAT FALLS, MONTANA**

The DEA Western Laboratory (San Francisco, California) recently received a submission of three standard design, plastic, 12 milliliter syringes containing a clear liquid with very small black specks suspended in the solution, suspected to be aqueous suspensions of psilocybin mushroom spores. The exhibits were seized by the Postal Inspector in Great Falls, Montana. Each syringe had a piece of colored tape wrapped around it; one red, one white, and one blue. Each tape had a different alphanumeric code written on it, the meaning of which was not intuitively obvious. For prosecution purposes (attempt to manufacture psilocybin and/or psilocin, controlled substances), it was necessary to show both that the spores were viable (would grow mushrooms), and that the mushrooms grown from the spores contained psilocybin and/or psilocin.

Visual examination of a drop of the liquid at 750x magnification revealed thousands of brownish colored, semi-transparent, oval shaped spores. Each solution was used to inoculate four different growth media: Potato, dextrose, yeast agar (PDY), dog food agar (DFA), malt extract agar (MEA), and brown rice powder and vermiculite. The basic procedures followed those provided in: Gross ST. Detecting psychoactive drugs in the developmental stages of mushrooms. *Journal of Forensic Sciences* 2000;45(3):527.

[Further details not provided in accordance with *Bulletin* policy.] Mycelium growth was obtained with two of the syringes; analysis of samples of the mycelium by GC/MS and GC/IRD confirmed psilocin (see: Casale JF. An aqueous-organic extraction method for the isolation and identification of psilocin from hallucinogenic mushrooms. *Journal of Forensic Sciences* 1985;30(1):247). Transfer of the mycelium to a grow chamber resulted in mushroom growth (see Photo 5), and analysis of the dried mushrooms confirmed psilocin. This was the first submission of this type to the Western Laboratory.



**Photo 5**

\* \* \* \* \*

**- INTELLIGENCE BRIEF -**

**SALVIA DIVINORUM IN DAYTON, OHIO**

The DEA North Central Laboratory (Chicago, Illinois) recently received a poly-drug submission of marijuana, powdered MDMA, various tablets, and an unknown green plant material, net mass 2.8 grams, similar in appearance to marijuana. The exhibits were seized in Dayton, Ohio by DEA Task Force agents pursuant to a Federal search warrant. After extraction with boiling chloroform for 10 minutes, analysis by GC/MS confirmed salvinorin A, the alleged psychoactive

component of *Salvia Divinorum*. Trace amounts of salvinorin B and salvinorin C were also noted in the GC/MS analysis. This was the laboratory's first encounter with this material.

[Editor's Notes: According to the analyst, a standard workup of the plant material with either methanol (leaves) or chloroform (ground leaves) did not extract salvinorin A; a 10 minute boiling chloroform extraction of the ground leaf material was required. The forensic analysis of *Salvia Divinorum* has been reported; see: Giroud C, Felber G, Augsburg M, Horisberger B, Rivier L, Mangin P. *Salvia divinorum*: A hallucinogenic mint which might become a new recreational drug in Switzerland. Forensic Science International 2000;112(2-3):143. Selected Intelligence Briefs concerning *Salvia Divinorum* were reprinted in the January 2002 issue of *Microgram* and the June 2003 issue of *Microgram Bulletin*. Of note, articles concerning *Salvia Divinorum* are appearing with increasing frequency in the mass media, including a *USA Today* feature article dated June 23rd, 2003; this suggests that many forensic laboratories will be encountering this material in the near future.]

\* \* \* \* \*

#### - INTELLIGENCE BRIEF -

#### UNUSUAL POLY-DRUG LABORATORY IN WASHINGTON, DC

The DEA Mid-Atlantic Laboratory (Largo, Maryland) responded to a clandestine drug laboratory located in the basement apartment of a large apartment complex in Washington, DC, that was the production site for a variety of unusual hallucinogens. The laboratory was discovered when the District of Columbia's Fire and Emergency Medical Services Department responded to a tenant's 911 call for a possible poisoning or overdose of the laboratory operator. Upon arrival, the emergency personnel noted strong and noxious chemical odors, and observed numerous chemicals and glassware, including a red-colored liquid cooking in a 250 milliliter Erlenmeyer flask on a hotplate in the living room (see Photo 6). After removal of the laboratory operator (who nearly died), the laboratory was processed by personnel from the DEA Washington Field Division and the Mid-Atlantic Laboratory.



**Photo 6**

Analysis of the red liquid indicated a mixture of 3,4,5-trimethoxybenzaldehyde and 3,4,5-trimethoxy-2-methyl-2-nitrostyrene, the intermediate for 3,4,5-trimethoxyamphetamine. Other seizures included 23 grams of 3,4,5-trimethoxy-2-ethyl-2-nitrostyrene (the intermediate for *alpha*-ethylmescaline), 125 grams of *alpha*-methyltryptamine, 200 grams of 3-(2-methyl-2-nitrovinyl)indole (the intermediate for *alpha*-methyltryptamine), 0.10 grams of

ergotamine tartrate (a precursor for LSD), and 10 grams of *Claviceps purpurea* (ergot fungus, a source of ergotamine). None of the exhibits were quantitated. Extensive handwritten notes and computer files were recovered that detailed recipes, experiment modifications, and actual yields and product descriptions, for the manufacture of each of the above substances. Chemical company catalogues were found along with chemical receipts for a wide variety of chemicals. Large amounts of laboratory equipment and supplies were inventoried, including an air-purifying respirator, ultraviolet light source, TLC plates, heating mantles, round bottom flasks, reflux condensers, separatory funnels, Erlenmeyer flasks, side-arm flasks, volumetric flasks, beakers, funnels, graduated cylinders, chromatography columns, thermometers, dropper bottles, filter paper, and a triple beam balance.

The defendant was indicted on the manufacture of *alpha*-methyltryptamine, possession of the listed chemical ergotamine, and attempt to manufacture trimethoxyamphetamine, *alpha*-ethylmescaline, and LSD. Ultimately, the defendant pled guilty to the manufacture of *alpha*-methyltryptamine. As part of his plea agreement, the defendant agreed to a debriefing, during which he indicated he had one year of collegiate level chemistry coursework, and also indicated that he had been “cooking” for over 10 years. He also admitted to attempting to manufacture lysergic acid diallylamide, an LSD analog. Despite the quantities of materials involved, and decade-long operation, the defendant claimed to have produced for personal use only.

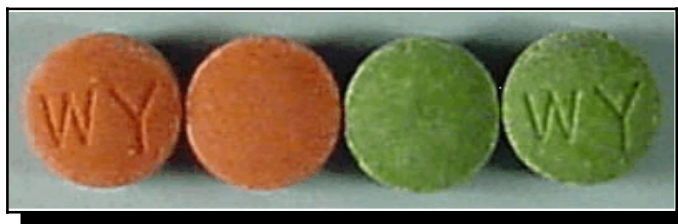
\* \* \* \* \*

## **- INTELLIGENCE BRIEF -**

### **“YA-BA”/“THAI TABS” METHAMPHETAMINE TABLETS - AN OVERVIEW**

Ya-Ba (“yah-bah”, Thai slang for “mad medicine”) originated in Southeast Asia’s Golden Triangle region – the drug producing area that straddles the borders of Burma, Laos, and Thailand that was the world’s top opium/heroin producing region for many decades. At present,

most Ya-Ba tablets are produced in Myanmar (Burma). Over the past five years, Ya-Ba (more commonly referred to as “Thai Tabs” within the United States) has become the most abused drug in Thailand. On May 12, 2003 the Reuters News Service reported that there are currently 2.5 million Thai users (equal to 4 – 5 percent of the population), spending 2 billion U.S. dollars (USD) a year on Ya-Ba tablets. In 2001, an individual Ya-Ba tablet sold for about 50 baht (about \$1.20 USD). However, since the beginning of May 2003, the Thailand government has arrested 58,000 drug traffickers and dealers in a highly aggressive counter-narcotics campaign, driving the price per tablet to about 300 baht ( about \$7.00 USD).



**Photo 7**

As of June 2003, the Source Determination Program (SDP) at the Special Testing and Research Laboratory (Dulles, Virginia) had analyzed over 450 Thai Tab exhibits. The results of these

analyses indicate there are at least 90 different tablet die sets in operation (therefore, there may be as many as 90 different clandestine sources). Thai Tabs encountered in the SDP have been red, orange or green (see Photo 7). The tablets are typically ¼ inch diameter, round, unscored, biconvex tablets which weigh 90-100 milligrams each. These dimensions are smaller, thinner, and lighter than typical Ecstasy tablets (for which they are sometimes mistaken by U.S. users and forensic chemists). Also in contrast to Ecstasy tablets, Thai Tabs have very few monograms. The four most common are: “WY”, “wY”, “Wy” and “wy.” Additional, less common monograms include “M99”, “R”, “888” and “555”. Chemical analyses indicates that the average Thai tablet contains 25 - 30 mg of d-methamphetamine hydrochloride and 50-60 mg of caffeine. However, the SDP has determined that the amount of both d-methamphetamine hydrochloride and caffeine can vary greatly (i.e., from 1 - 47 mg/tablet and 11 - 97 mg/tablet, respectively). Other drugs found in Thai Tabs include: Phenacetin, theophylline, amphetamine sulfate, ephedrine and dimethylamphetamine. A small amount of ethyl vanillin is also typically present, and is included to mask the residual chemical odor from the crude, clandestine manufacturing processes.

Despite their form, Thai Tabs are not intended for oral consumption. Rather, they are smoked for a stronger, faster high, similar to the way heroin is smoked when one “chases the dragon”, or the smoking of “Ice” methamphetamine. The solid dosage form (tablet) allows for easier manipulation with smoking paraphernalia. Due to their superficial similarity with Ecstasy tablets, however, Thai Tabs are occasionally mistaken for and taken as Ecstasy by U.S. users. In addition, an increasing number of “classic” design Ecstasy tablets - *not* Thai Tabs - have been found to include methamphetamine as an added component or as the sole controlled substance. A recent survey of all “classic” Ecstasy tablets that had ever been analyzed by the SDP indicated that 2.5 percent contained a mixture of MDMA and methamphetamine, and 3 percent contained methamphetamine only. Again, however, these latter tablets are *not* Thai Tabs, but rather are so-called MDMA “mimic” tablets containing methamphetamine.

Ya-Ba is commonly seen throughout eastern Asia, southeastern Asia, the East Indies, and Australia. Some recent seizures in those areas totaled hundreds of thousands to millions of tablets. U.S. Customs Service personnel have recently seized Thai Tabs in California, Hawaii, and other western states. In contrast to the seizures in southeastern Asia, however, thus far the typical seizure in the U.S. is 500 - 1000 tablets, usually found concealed in international mail packages sent from one family member in Asia to another in the U.S. However, this problem is expected to increase in the future.

\* \* \* \* \*

#### **SOUTH AFRICAN LOGO INDEX POSTED ON THE INTERNET**

The South African Police Service, National Forensic Science Laboratory (Pretoria, South Africa) has posted its Drug Logo Index on the Internet, at the following URL:

<http://www.saps.gov.za/profile/component/forensics/drugs/index.htm>

\* \* \* \* \*

## Selected Intelligence Brief

### Information Bulletin: Khat (*Catha Edulis*).

National Drug Intelligence Center  
319 Washington St., 5th Floor  
Johnstown, PA 15901

[Unclassified; Reprinted With Permission]



The availability of khat, a plant containing stimulants regulated under the Controlled Substances Act, is increasing in the United States. The amount of khat seized by federal law enforcement officers increased dramatically from 14 metric tons in 1995 to 37 metric tons in 2001. Moreover, in the first 6 months of 2002 federal officers seized nearly 30 metric tons of the drug. Individuals of Somali, Ethiopian, and Yemeni descent are the principal transporters and distributors of khat.

### Background

Khat (*Catha edulis*)--also known as African salad, bushman's tea, gat, kat, miraa, qat, chat, tohai, and tschat--is a flowering shrub native to northeast Africa and the Arabian Peninsula. The plant usually grows from 2 to 12 feet high; however, it can reach 20 feet. Khat plants typically are grown among crops such as coffee, legumes, peaches, or papayas. Fresh khat leaves contain cathinone--a Schedule I drug under the Controlled Substances Act; however, the leaves typically begin to deteriorate after 48 hours, causing the chemical composition of the plant to break down. Once this occurs, the leaves contain cathine, a Schedule IV drug. Fresh khat leaves are glossy and crimson-brown in color, resembling withered basil. Deteriorating khat leaves are leathery and turn yellow-green in color.

### Schedule I and Schedule IV Drugs

Drugs classified as Schedule I under the Controlled Substances Act are those deemed to have a high potential for abuse, no currently accepted medical use in treatment in the United States, and a lack of accepted safety for use of the drug under medical supervision. Schedule IV drugs are classified as having a low potential for abuse and a currently accepted medical use in treatment in the United States; abuse of Schedule IV drugs may lead to limited physical or psychological dependence.

## **Abuse**

In the United States khat use is most prevalent among immigrants from Somalia, Ethiopia, and Yemen. These individuals use the drug in casual settings or as part of religious ceremonies. Abuse levels are highest in cities with sizable populations of such immigrants including Boston, Columbus, Dallas, Detroit, Kansas City, Los Angeles, Minneapolis, Nashville, New York, and Washington, D.C. Law enforcement reporting indicates that some other groups in these areas have begun abusing the drug.

Khat typically is ingested by chewing the leaves--as is done with loose tobacco. Dried khat leaves can be brewed in tea or cooked and added to food. After ingesting khat, the user experiences an immediate increase in blood pressure and heart rate. Abusers claim that the drug lifts spirits, sharpens thinking, and increases energy--effects similar to but less intense than those caused by abusing cocaine or methamphetamine. The effects of the drug generally begin to subside between 90 minutes and 3 hours after ingestion; however, they can last up to 24 hours. A state of mild depression can follow periods of prolonged use. Taken in excess, khat causes extreme thirst, a sense of exhilaration, talkativeness, hyperactivity, wakefulness, and loss of appetite. Repeated use can cause manic behavior with grandiose delusions, paranoia, and hallucinations. It also can cause damage to the nervous, respiratory, circulatory, and digestive systems.

Many Muslims, including Somalis, use khat during the religious month of Ramadan. Law enforcement officials in the United States indicate that a large number of khat seizures occur during Ramadan. In 2002 Ramadan occurred from November 5 through December 4. During November and December, U.S. Customs Service (USCS) officials seized nearly 3,000 kilograms of khat from airports in California, Illinois, Kentucky, Minnesota, New York, and Tennessee. [Note: the USCS is now part of the Bureau of Immigration and Customs Enforcement Service under the Department of Homeland Security.]

## **Availability**

Seizure data indicate that the availability of khat is increasing in the United States. According to Federal-wide Drug Seizure System (FDSS) data, federal law enforcement officials seized 14 metric tons in 1995, over 37 metric tons of khat in 2001, and nearly 30 metric tons in the first 6 months of 2002. State and local law enforcement officials also frequently seize kilogram quantities of khat. For example, in October 2002 local law enforcement officials in Merriam, Kansas, seized nine boxes of khat, each weighing over 13 kilograms, and arrested two Somali nationals.

The use of khat is accepted within the Somali, Ethiopian, and Yemeni cultures. In these countries khat is not a controlled substance and is openly sold at markets. Many immigrants from these countries continue to use khat in the United States. As such, khat frequently is advertised openly on signs in ethnic restaurants, bars, grocery stores, and smoke shops. Signs often are printed in the native language of the store owner. Common names for khat that may appear on such signs include kat, qat, chat, gat, tohai, tschat, and mirraa. Khat generally sells for \$300 to \$400 per kilogram or \$28 to \$50 per bundle (40 leafed twigs measuring 12 to 15 inches in length).

## **Transportation**

Khat must be transported quickly to its intended market because of its limited shelf life. Thus, the drug often is transported into the United States, typically through Great Britain and Canada, primarily via package delivery services and, to a lesser extent, by couriers aboard commercial aircraft. Khat also is



transported into the United States from Canada by private vehicle. To maintain freshness during transport, khat frequently is wrapped in plastic bags, banana leaves, or newspapers and sprinkled with water.



### **Khat Rolled in Newspaper for Transport**

Khat smugglers use various tactics to avoid law enforcement scrutiny when shipping the drug via package delivery services. For example, khat usually is listed on manifests (cargo invoices) as Abyssinian or African tea, African salad, molokheya (an Egyptian vegetable), perishable lettuce or fresh vegetables, tobacco leaves, and herbs. It also has been listed as auto parts on at least one occasion.

The amount of khat seized from packages arriving from foreign destinations, as well as the frequency with which these seizures occur, illustrates the extent to which package delivery services are used to transport khat into the United States. According to USCS, kilogram quantities of khat were seized daily between January and September 2002 from packages arriving at the package delivery facility located at the Memphis International Airport. USCS officials seized 3,916 kilograms of khat during that period.

The following examples demonstrate that seizures involving package delivery services are common in other parts of the country as well.

*Minneapolis-St. Paul, Minnesota:* On December 31, 2002, USCS officials seized over 146 kilograms of khat concealed in seven boxes shipped from the United Kingdom and arrested a 29-year-old Minneapolis resident as he accepted receipt of the boxes.

*New York, New York:* In August 2002 USCS officials seized 22 packages containing more than 59 kilograms of khat that had arrived in New York from London. The packages were addressed to individuals in several U.S. cities. During a subsequent controlled delivery, the Kansas City, Kansas, Police Department Interdiction Unit arrested four male Somali nationals and one male Ethiopian national. The Omaha Commercial Interdiction Unit also conducted a controlled delivery and arrested

two Somali nationals. Other controlled deliveries have been made in Minneapolis; Norfolk, Nebraska; Seattle; and Sioux City, Iowa.

*Kansas City, Missouri:* In March 2002 USCS officials seized over 68 kilograms of khat concealed in five boxes shipped from London and arrested two Somali nationals who accepted receipt of the boxes in Kansas City.

*Kansas City, Kansas:* On October 18, 2002, officers with the Merriam Police Department arrested two Somali men from Minneapolis who were attempting to retrieve several packages containing khat that had been shipped from London, England, to various locations throughout the Kansas City area. The packages were addressed to various individuals with Middle Eastern names and delivered to 10 different hotels via package delivery services. The khat was to be distributed in Minneapolis. At the time of their arrest, the men had retrieved seven of the packages; the police collected the other three.

Khat also is transported into the United States by couriers aboard commercial aircraft. Khat smugglers in Great Britain frequently attempt to recruit couriers who are not of African or Middle Eastern origin, believing such individuals are subject to less scrutiny when entering the United States.



**Khat Wrapped in Banana Leaves and Smuggled in a Suitcase**

The following example illustrates the use of this smuggling method.

*Detroit, Michigan:* On January 13, 2003, USCS officials seized approximately 80 kilograms of khat concealed in the luggage of two British women arriving from London. Law enforcement officials executed a controlled delivery of the khat to a hotel near the airport and arrested two Somali men from Nashville, Tennessee, who attempted to receive the drug. The two Somali men were to transport the khat by private vehicle back to Tennessee for distribution among the Somali community in Nashville.

## Outlook

Khat likely will become increasingly available in the United States. Abuse of the drug will remain most prevalent in communities with large Somali, Ethiopian, and Yemeni populations. Recent law enforcement reporting indicates that some Caucasian individuals have begun abusing khat; however, the drug likely will not become widely popular due to its limited shelf life and because stimulant abusers commonly seek more intense physiological effects, such as those produced by cocaine and methamphetamine. Although the drug's popularity likely will remain limited to Somali, Ethiopian, and Yemeni populations, khat will remain a growing concern among law enforcement agencies in the United States because of its increasing availability.

## Sources

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- \* New York State Office of Alcoholism and Substance Abuse Services
- \* Northwestern Ontario (Canada) Tri-Force/Kenora Joint Forces Drug Unit
- \* Street Drugs, Publishers Group, Plymouth, Minnesota, [www.streetdrugs.org](http://www.streetdrugs.org)
- \* U.S. Department of Homeland Security  
Directorate of Border and Transportation Security  
Bureau of Immigration and Customs Enforcement Service
- \* U.S. Department of Justice  
Drug Enforcement Administration  
Federal Bureau of Investigation  
Federal-wide Drug Seizure System

\* \* \* \* \*

## SELECTED REFERENCES

[Note: Selected references are a compilation of recent publications of presumed interest to forensic chemists. Unless otherwise stated, all listed citations are published in English. If available, the email address for the primary author is provided as the contact information. Listed mailing address information (which is sometimes cryptic or incomplete) exactly duplicates that provided by the abstracting services.]

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2. Esseiva P, Dujourdy L, Anglada F, Taroni F, Margot P. **A methodology for illicit heroin seizures comparison in a drug intelligence perspective using large databases.** *Forensic*



- Science International 2003;132(2):139. [Editor's Notes: Presents a methodology for comparing heroin profiles. The authors claim that the methodology is solid, reliable, and simple. Contact: BCH, Institut de Police Scientifique et de Criminologie, University of Lausanne, VD, Lausanne-Dorigny 1015, Switzerland.]
3. Gimeno P, Besacier F, Chaudron-Thozet H. **Optimization of extraction parameters for the chemical profiling of 3,4-methylenedioxymethamphetamine (MDMA) tablets.** Forensic Science International 2003;132(3):182. [Editor's Notes: Presents an optimized extraction procedure for recovery of impurities from MDMA tablets using diethyl ether extraction from a pH 11.5 buffered solution, followed by GC/MS analysis. Contact: Laboratoire de Police Scientifique de Lyon, 31 Avenue Franklin Roosevelt, Ecully 69134, France.]
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  10. Azoury M, Zelkowicz A, Goren Z, Almog J. **Evaluation of ninhydrin analogues and other electron-deficient compounds as spray reagents for drugs on thin layer chromatograms.**

- Microgram Journal 2003;1(1-2):23. [Editor's Notes: Evaluates approximately two dozen spray reagents on 14 drugs of forensic interest, and identifies several with enhanced efficacy vs ninhydrin. Contact: [miriama@vms.huji.ac.il](mailto:miriama@vms.huji.ac.il)]
11. Vohlken BA, Layton SM. **Instrumental separation of 3,4-methylenedioxyamphetamine (MDA) from 1-(3,4-methylenedioxyphenyl)-2-propanol, a co-eluting compound.** Microgram Journal 2003;1(1-2):32. [Editor's Notes: Presents a study of the referenced co-elution problem; includes the mass spectra for the title alcohol. Contact: [barbaravohlken@fdle.state.fl.us](mailto:barbaravohlken@fdle.state.fl.us)]
  12. Newell CJ. **Potency of cannabis seized in central Florida during June 2002.** Microgram Journal 2003;1(1-2):37. [Editor's Notes: Presents a mini-review of the title topic, and compares the results versus the national statistics for 2002. Contact: [ch319427@pegasus.cc.ucf.edu](mailto:ch319427@pegasus.cc.ucf.edu)]
  13. Deakin AL. **A study of acids used for the acidified cobalt thiocyanate test for cocaine base.** Microgram Journal 2003;1(1-2):40. [Editor's Notes: Presents a study of the use of substitute acids for concentrated hydrochloric acid in the referenced test, and makes some pertinent recommendations. Contact: [annadeakin@fdle.state.fl.us](mailto:annadeakin@fdle.state.fl.us)]
  14. Garcia AD, Catterton AJ. **1,4-Butanediol (BD) - Forensic profile** Microgram Journal 2003;1(1-2):44. [Editor's Notes: Presents a forensic profile of the title compound. Contact: [cation1072@aol.com](mailto:cation1072@aol.com)]
  15. Klein RFX, Hays PA. **Detection and analysis of drugs of forensic interest, 1992 - 2001; A literature review** Microgram Journal 2003;1(1-2):55. [Editor's Notes: A review including 1,377 references. Contact: [microgram\\_editor@mailsnare.net](mailto:microgram_editor@mailsnare.net)]
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2. McKay GJ. **Forensic characteristics of organic peroxide explosives (TATP, DADP, and HMTD).** Kayaku Gakkaishi 2002;63(6):323. [Editor's Notes: Comprehensive analysis for triacetone triperoxide, diacetone diperoxide, and hexamethylene triperoxide diamine are reported. These homemade explosives have been implicated in clandestine laboratory booby traps. The article is written in English. Contact: Forensic Explosives Laboratory, Dstl Fort Halstead, Sevenoaks, Kent TN14 7BP, United Kingdom.]
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Handling of currency-mimicking blanks by counting machines or by hand resulted in transfer of minute quantities of cocaine to the blanks. Contact: School of Chemistry, Organic and Biological Section, University of Bristol, Cantock's Close, Bristol BS8 1TS (country not listed, but assumed to be the United Kingdom).]

4. Shen H, Carter JF, Brereton RG, Eckers C. **Discrimination between tablet production methods using pyrolysis-gas chromatography-mass spectrometry and pattern recognition.** Analyst 2003;128:287. [Editor's Notes: The presented technique can differentiate between tablets produced by wet granulation versus direct compression. Contact: School of Chemistry, University of Bristol, Cantock's Close, Bristol, BS8 1TS, United Kingdom.]
5. Pihlainen K, Sippola E, Kostianen R. **Rapid identification and quantitation of compounds with forensic interest using fast liquid chromatography - ion trap mass spectrometry and library searching.** Journal of Chromatography A 2003;994(1-2):93. [Editor's Notes: The title technique uses a monolithic column, gradient elution, and a 5 minute total analysis time, with detection limits ranging from 10 to 50 ng/mL for 14 forensically relevant drugs (opiates, benzodiazepines, LSD, and barbiturates). The method was applicable to urinalysis. Contact: Kostianen R, Natl Bur Invest, Crime Lab, POB 285, FIN-01301 Vantaa, Finland.]
6. Matsumura S, Takezawa H, Isa K. **The fragmentation of amine cluster ions including HCl - Proton affinities of drugs of abuse.** Journal of the Mass Spectrometry Society of Japan 2003;51(1):196. [Editor's Notes: The results are used to determine the proton affinities of methamphetamine and analogs (unspecified in abstract). Contact: Forensic Science Laboratory, Fukui Prefectural Police Headquarters 3-17-1 Ohte, Fukui 910-8515, Japan.]
7. Adar F, IeBourdon G, Reffner J, Whitley A. **FT-IR and Raman microscopy on a united platform - A technology whose time has come.** Spectroscopy 2003;18(2):34. [Editor's Notes: The referenced combined instrument is introduced and discussed. [Note: This *may* be an "infomercial"; not clear from abstract]. Contact: Jobin Yvon, Inc., Edison, NJ (no zip code was provided.)

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## THE DEA FY - 2003 STATE AND LOCAL FORENSIC CHEMISTS SEMINAR SCHEDULE

The remainder of the FY - 2003 schedule for the DEA's State and Local Forensic Chemists Seminar is as follows:

September 15 – 19, 2003

Note that the school is open only to forensic chemists working for law enforcement agencies, and is intended for chemists who have completed their agency's internal training program and have also been working on the bench for at least one year. There is no tuition charge for this course. The course is held in Northern Virginia, near the Washington/Dulles International Airport. For additional information, eligibility requirements, or to enroll, see the September 2002 issue of *Microgram Bulletin*, or call 703 668-3337.

\* \* \* \* \*



## EMPLOYMENT OPPORTUNITIES

### 1. DuPage County Sheriff's Office Crime Laboratory

(Second Posting)

**Position:** Forensic Chemist (FS-II)

**Location:** Wheaton, Illinois (34 Miles West of Chicago)

**Salary Range:** \$37,670 - \$71,270 per year (Starting Salary is Negotiable and Commensurate with Experience.)

**Application Deadline:** Open Until Filled

**Duties:** Responsibilities will include the examination and evaluation of scientific evidence; interpretation of laboratory analyses and results; preparation of written reports, and the ability to testify as an expert witness. Ancillary responsibilities include maintenance of laboratory equipment and supplies; management of caseloads, and attendance at workshops and seminars as required.

**General Requirements:** The applicant must be skilled in using gas chromatography, mass spectroscopy, ultraviolet and infrared spectrophotometry and other drug screening equipment, and must be able to work independently. Minimum requirements of the position include, but are not limited to: Bachelor's degree in a natural science; two years of practical working experience in a forensic laboratory including court testimony as an expert witness; and above average knowledge of and ability to apply scientific methods and disciplines of laboratory testing and analysis.

**Application Procedures:** For further information please contact:

John Collins, Laboratory Director  
501 N. County Farm Road  
Wheaton, IL 60187  
Telephone: (630) 682-7198  
Fax: (630) 682-7908  
E-mail: [jcollins@dupageco.org](mailto:jcollins@dupageco.org)

\* \* \* \* \*

### 2. State of Connecticut, Department of Public Safety, Scientific Services Division

(Second Posting)

**Position:** Director of Toxicology, Controlled Substances / Toxicology Section

**Location:** Hartford, Connecticut

**Salary Range:** Negotiable

**Application Deadline:** Open Until Filled

**Overview:** The State of Connecticut is offering you that opportunity to create your own vision as Director of the Controlled Substances and Toxicology Laboratory, in the Scientific Services Division, Department of Public Safety, which has one of the most professional and prestigious reputations in the United States. As the Chief Toxicologist, you can focus your energies on directing staff and operations of the laboratory, as administrative responsibilities are shared. Your working environment will be with a highly dedicated and professional staff supported by cutting edge tools and technology.

**Duties:** We are seeking an individual with proven leadership abilities, a passion for research and development, and the ability to complete the laboratory accreditation process. Responsibilities include: Directing staff and scientific operations of a forensic toxicology laboratory; coordinates, plans and manages laboratory programs; formulates program goals and develops laboratory policy; develops and implements techniques necessary to examine chemical and biological evidence; researches new methodology; reviews laboratory findings and supervises report preparation; interprets and administers pertinent laws; trains, supervises and evaluates staff; responds to queries regarding drug effects and chemical actions; serves as expert witness on relevant issues in court cases; and performs related duties as required.

**Qualifications:** A minimum of 10 years experience and training in toxicology and criminalistics in a public health or general toxicology laboratory. Two years of this experience must have been in a supervisory capacity in a major program in forensic toxicology. You must have a comprehensive understanding of the principles and techniques of analytical chemistry (to include infrared and ultra violet spectrophotometry, gas and high performance liquid chromatography, mass spectrometry, and immunoassays). Also, a comprehensive knowledge of the principles of pharmacokinetics and pharmacodynamics is required. Passing an extensive background check is a hiring requirement. The ideal candidate will have a Ph.D. in Toxicology, pharmacology, or related biological or chemical science and will be Board Certified or eligible for Board Certification in Forensic Toxicology.

In addition to a competitive salary, the State of Connecticut total compensation plan includes a generous benefit package worth over 36% of an employees' annual salary. Benefits and options include: A choice of medical and dental plans designed to suit your need, long and short term disability, life insurance, an excellent retirement plan, deferred compensation plan, 12 paid holidays, personal leave days, sick time, and a generous vacation plan. For more information go to: [www.das.state.ct.us](http://www.das.state.ct.us).

**Application Procedures:** Please forward your resume, cover letter and salary requirements to:

Patsy McLaughlin  
Manager of Recruitment  
State of Connecticut  
Department of Administrative Services  
165 Capitol Avenue, R. G-1  
Hartford, CT 06106

\* \* \* \* \*

### 3. Indian River Crime Laboratory

(First Posting)

**Position:** Forensic Chemist

**Location:** Fort Pierce, Florida

**Salary:** \$45,000 – \$60,000, Depending on Experience

**Application Deadline:** Open Until Filled

**Duties:** Responsibilities include the analysis of controlled substances; interpretation of laboratory analyses and results; preparation of written reports; and the ability to testify as an expert witness.

**General Requirements:** The applicant must be skilled in using gas chromatography, mass spectroscopy, ultraviolet and infrared spectrophotometry and other drug analysis equipment and methodologies. A familiarity with the technical and safety requirements of ASCLD-LAB, and demonstrated proficiency testing in controlled substance analysis are required. A Master's degree in chemistry or forensic science (with chemistry undergraduate degree) and two years of forensic laboratory experience are preferred. Experience in head-space BAC analysis is desirable. An extensive background investigation is required, and laboratory personnel are subject to random drug testing. EEO.

**Application Procedure:** Applications may be obtained on-line at [www.stluciesheriff.com](http://www.stluciesheriff.com) or by contacting:

Saint Lucie County Sheriff's Office  
Human Resources Department  
4700 W. Midway Road  
Fort Pierce, Florida 34981-4825  
Phone: (772) 462-3206  
Fax: (772) 462-3218

For information about the position, contact:

Daniel C. Nippes  
Chief Criminalist  
Indian River Crime Laboratory  
2502 S. 35th Street  
Fort Pierce, Florida 34981  
[dnippes@ircc.edu](mailto:dnippes@ircc.edu)  
Phone: (772) 462-4765

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## SCIENTIFIC MEETINGS

1. **Title:** 29th Annual Meeting of the Northeastern Association of Forensic Scientists

(Second Bimonthly Posting)

**Sponsoring Organization:** Northeastern Association of Forensic Scientists

**Inclusive Dates:** November 5 - 8, 2003

**Location:** Crowne Plaza Hotel, Pittsfield, MA

**Meeting Registration Procedure, Deadline, and Costs:** [Not Provided]

(Continued on Next Page)

**Recommended Lodging (Registration Deadline and Costs):** [Not Provided]  
**Contact Individual's Name, Phone Number, and email Address:** Jennifer F. Limoges, 518/457-0054 (FAX 485-8502),  
[jlimoges@troopers.state.ny.us](mailto:jlimoges@troopers.state.ny.us)  
**Website:** [Not Provided]

\* \* \* \* \*

2. **Title:** SWAFS 2003 Training Conference (Second Bimonthly Posting)  
**Sponsoring Organization:** Southwestern Association of Forensic Scientists  
**Inclusive Dates:** November 3 - 6, 2003  
**Location:** Radisson Plaza Hotel, Fort Worth, TX  
**Meeting Registration Procedure, Deadline, and Costs:** [Not Provided]  
**Recommended Lodging (Registration Deadline and Costs):** [see: [www.radisson.com/ftworthtx](http://www.radisson.com/ftworthtx) 800/333-3333]  
**Contact Individual's Name, Phone Number, and email Address:** Michelle O'Neal, 817/920-5700, x163,  
[fortworth2003@swafs.org](mailto:fortworth2003@swafs.org)  
**Website:** [[www.swafs.org](http://www.swafs.org)]

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3. **Title:** Clandestine Laboratory Investigating Chemists Association, 13th Annual Technical Training Seminar (Second Posting)  
**Sponsoring Organization:** Clandestine Laboratory Investigating Chemists Association  
**Inclusive Dates:** September 3 - 6, 2003  
**Location:** Richmond, VA (Omni Richmond Hotel)  
**Meeting Registration Procedure, Deadline, and Costs:** [Contact Organizers for Flyer]  
**Recommended Lodging (Registration Deadline and Costs):** [Contact Organizers for Flyer]  
**Contact Individual's Name, Phone Number, and email Address:** Two Contacts listed: 1) Roger Ely, 415/744-7051,  
[rogely@atdial.net](mailto:rogely@atdial.net); 2) Rick Fortune, 804/786-9637, [rfortune@dfs.state.va.us](mailto:rfortune@dfs.state.va.us)  
**Website:** [None]

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## THE JOURNAL/TEXTBOOK COLLECTION EXCHANGE

### *FREE TO ANY SUBSCRIBER*

Unless otherwise noted, requests for any of the following offerings should be emailed to the *Microgram* Editor at: [microgram\\_editor@mailsnare.net](mailto:microgram_editor@mailsnare.net) Requests should include complete mailing address information, **and should confirm that the provided destination is a "safe" (irradiation free) address.** Unless otherwise noted, in cases of competing requests, libraries have precedence. [Note: Postage for offerings from the DEA Office of Forensic Sciences will be covered by the Office.]

- 1) ***Analyst*** 2002;127(11) (November 2002); 2002;127(12) (December 2002); 2003;128(1) (January 2003). Note: Should be requested only by a subscriber who needs to fill holes in an existing collection.
- 2) ***Analytical Chemistry*** Approximately 20 years worth of *Analytical Chemistry*, roughly 1970 - 1990. Some issues missing. Contact Melvin Ritter at: [ritter.melvin@epamail.epa.gov](mailto:ritter.melvin@epamail.epa.gov)
- 3) ***Environmental Chemistry*** Approximately 10 years of *Environmental Chemistry*, roughly early 1980's through early 1990's. Not complete. Contact Melvin Ritter at: [ritter.melvin@epamail.epa.gov](mailto:ritter.melvin@epamail.epa.gov)
- 4) ***Journal of Chromatographic Sciences*** 1989;27(1) through 1997;35(1); mostly bound.

- 5) *Journal of Forensic Sciences* 2000;45(6) (November 2000). Note: Should be requested only by a subscriber who needs to fill a hole in an existing collection.
- 6) *Clinical Chemistry* 2002;48(Numbers 1 - 12). One full year, complete.
- 7) *Microgram* - **Last Call!!!** In mid-2002, the Office of Forensic Sciences completed a comprehensive reorganization and inventory of its entire *Microgram* archive 1967 – 2002. As a result, several thousand excess monthly issues, dating back to 1971, were identified. These issues were first offered in the September 2002 issue of *Microgram Bulletin*, with the specification that they were intended to fill "holes" in existing collections (not to create new, partial collections), and over 500 issues were requested in that spirit. The remaining issues are now available to any current *Microgram* subscribing office **that has a law enforcement affiliation** (all issues 1967 to 2002 were and remain law enforcement restricted). The Office also has several dozen "bound" (2 year) issues, from 1984 - present, and these are also available any current *Microgram* subscribing office **that has a law enforcement affiliation**.

All issues are now available on a first come/first serve basis, including to those who wish to create a "best possible" partial collection. Note that there are many gaps in the available archive (including many entire years), and only a very few available copies for other issues. It is therefore quite unlikely that any request can be completely satisfied. Also note that the condition of the available issues vary from "mint" to only "fair".

Note that the remaining collection will be destroyed within the next three months, so interested subscribers should respond as soon as possible.

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The next offering of journals and textbooks will be in the October 2003 issue of *Microgram Bulletin*. Subscribers who are interested in donating items or collections should consult the *Microgram* website for instructions.

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# Computer Corner

## Terminology Considerations

# #172

by Michael J. Phelan  
DEA Digital Evidence  
Laboratory

Digital evidence report writing is usually a straightforward recitation of findings of fact, with occasional expert opinions rendered regarding computer ownership, access, timelines of events, and user-computer or user-network interactions. A critical aspect for most digital evidence examinations is the processing of the original evidence to produce a report that accurately and precisely describes the information and data. This can be challenging, because the descriptive terminology in the digital evidence field can include quite similar terms that have significantly different technical and legal meanings. For example, some of the technical terms in current use to describe some form of a copy include: duplicate, bit stream copy, image, physical copy, logical copy, and work or working copy. Caution is required when using such closely related terminology, because there are specific technical, legal, and informational implications associated with each term. The differences between terms are important when drafting up examination notes and (especially) when writing the final report.

### Technical

In a technical sense, each term in the digital evidence field has a specialized meaning. Most

often, that meaning has evolved over the years, largely as a result of usage by specific computer forensic software manufacturers. For example, the term “duplicate” has come to be associated with the concept of an “exact copy” that is identical to the original. That may seem intuitively obvious, but there are subtleties.

### Duplicates

Duplicates are a one-to-one mapping (copying) of hard drive storage areas known as sectors. Analogous terms include mirror image, physical copy, or a sector-by-sector copy. Duplication involves the copying of all “addressable” sectors except for bad sectors located on the original hard drive. Duplicate hard drives are usually bootable unless there is some specialized “security handshake” between the original hard drive and the original computer’s motherboard. [Some laptop manufacturers, such as certain models of IBM, have incorporated the “handshake” technique as an extra information security measure.] Duplicates are created by using specialized forensic software or hard drive-to-hard drive duplicator hardware (Solomasster or Logicube). Until recently, the creation of duplicates has been the preferred method of digital evidence acquisition.

### Images

Another technical term commonly used in the copying field is “image”. An image is a file that contains all of the data and attributes of the original evidence hard drive. The image file can be mounted (processed) by computer forensic examination software to produce a virtual drive that can be keyword searched or viewed. The image file is usually stored in either 2-gigabyte or 640 megabyte blocks of data. Images may contain imbedded checksum values for data authentication purposes. However, images are not “exact copies” in the sense that they are not directly bootable, and programs contained within the image cannot execute; but as noted above, they can be easily accessed by computer forensic software as a virtual drive. And technical issues such as hard drive geometry or hard drive file structure type are greatly simplified, thereby making access to the user’s data quick and straightforward. Images can be used to create a bootable drive if needed. Common digital evidence forensic imaging software containing imbedded checksums include Guidance Software’s Encase, Safeback from New Technologies Incorporated, and Symantec’s Ghost. [Imaging software that does not contain imbedded checksums include: Unix dd

command, the Department of Defense Computer Forensic Lab's DCFL-DD, or ASR's SMART software.] Images have become the preferred method of acquisition in many types of digital evidence examinations, because it is easy to process regardless of file structure.

### **Logical Copy**

A third technical term in use is "logical copy". A logical copy involves the copying of a specific part of a hard drive. The logical copy may consist of a small unit of a hard drive or floppy data storage such as a cluster or file. Or it might include larger storage areas such as a file directory or even a complete partition. Logical copies are accurate representations of the original, but are (obviously) not complete copies of the original media.

### **Why Then Use Them?**

Logical copies are useful when the Case Agent is faced with very large (i.e., terabytes or pentabytes) data storage technologies. In such cases, it may be nearly impossible to copy all of the data. [Fortunately, however, it is usually not necessary to copy everything.] Logical copies are sometimes the only practical method of evidence collection for network examinations, especially when an entire network cannot be shut down for duplication or imaging.

### **The Legal Perspective**

At present, the legal domain recognizes two terms – "original" and "duplicate". Federal Rule of Evidence 1001 defines original as follows: "An

original of a writing or recording is the writing or recording itself or any counterpart intended to have the same effect by a person executing or issuing it. An original of a photograph includes the negative or any print therefrom. If data are stored in a computer or similar device, any printout or other output readable by sight, shown to reflect the data accurately, is an original".

A duplicate is defined as follows: "...a counterpart produced by the same impression as the original, or from the same matrix, or by means of photography, including enlargements or miniatures, or by mechanical or electronic re-recording, or by chemical reproduction, or by other equivalent techniques which accurately reproduces the original".

Best Evidence Rule 1003 states that: "a duplicate is admissible to the same extent as the original unless: (1) A genuine question is raised as to the authenticity of the original; or (2) In the circumstances it would be unfair to admit the duplicate in lieu of the original." It is clear that the Federal legal system confers special meaning to the word "duplicate".

### **The Issue Restated**

The formal definitions above illustrate why digital evidence examiner personnel must exercise caution in the use of technical terms. On the one hand, law enforcement, jurists, and juries may not understand terms such as bit stream, image, or logical copy. On the other, the term "duplicate" has specific

technical and legal meaning. The imprecise or inaccurate use of technical copying terms by examiner personnel could be a source of embarrassment upon aggressive cross-examination.

### **DEA Practice**

DEA has bridged the technical-legal gap by streamlining its report writing to use only the word "copy". The technical details of the copying process are recorded in the examination notes and are available should that particular examination procedure be questioned. This approach simplifies the final report of examination for all audiences, and utilizes an all-encompassing inclusive term that will always be correct regardless of technique used.

### **Recommendations**

Digital evidence examiners and program managers need to carefully review their standard operating procedures to ensure that their reports accurately reflect what they actually do. Organizations publishing recommended best practices or guidelines need to incorporate as much flexibility into their descriptive terms as possible. When in doubt, keep it simple.

Questions or comments?  
E-mail: [mphelan@erols.com](mailto:mphelan@erols.com)





# Microgram

## *Bulletin*

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**VOL. XXXVI, NO. 8**

**AUGUST 2003**

**- INTELLIGENCE ALERT -**

**VERY LARGE OPIUM POPPY PLANTATION DISCOVERED  
IN THE SIERRA NATIONAL FOREST, CALIFORNIA**

[From the July 8, 2003 *Narcotics Digest Weekly* (NDIC);  
Unclassified, Reprinted with Permission]

On June 20, 2003, U.S. Forest Service officers, responding to information provided by a hiker, discovered approximately 40,000 opium poppies that were growing in a remote area of the Sierra National Forest. When Forest Service officers arrived at the location, they observed three men scoring the poppy pods (making thin cuts in the pods to allow opium to seep out for later collection). The men fled when approached by the officers. Most of the opium poppies were between 1 and 3 feet tall and were growing in six plots over 1.5 acres on a south-facing slope. Forest Service officials reported that the opium poppies would be eradicated, and that no chemicals or materials commonly used to convert opium to morphine or heroin had been discovered.

*NDIC Comment:* Opium poppies primarily are cultivated in four foreign source areas (Mexico, South America, Southeast Asia, and Southwest Asia). Very limited opium cultivation has been sporadically reported in areas of the United States including Idaho, Montana, Oregon, and

Washington. The above incident is notable because of the large number of plants, and because it is the first documented occurrence of opium cultivation on National Forest Service lands.

[Editor's Comments: Within the U.S. counter-narcotics communities, the conventional wisdom has held that large-scale cultivating of coca and/or opium poppies within the continental United States is highly unlikely, because both are highly labor-intensive enterprises, and also difficult to conceal. The above finding suggests that this conventional wisdom needs to be rethought.]

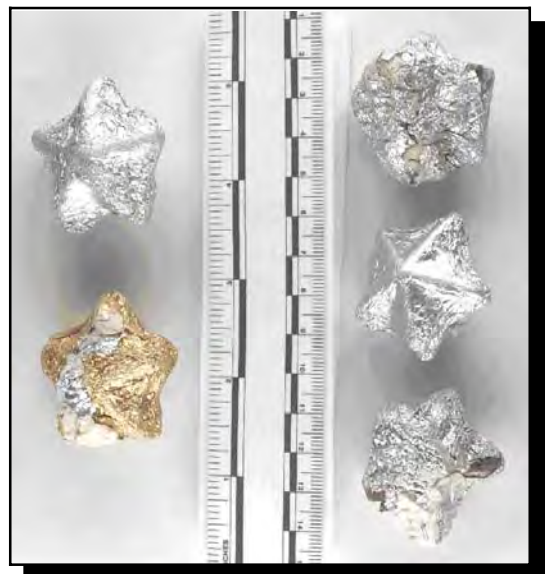
\* \* \* \* \*

### **- INTELLIGENCE ALERT -**

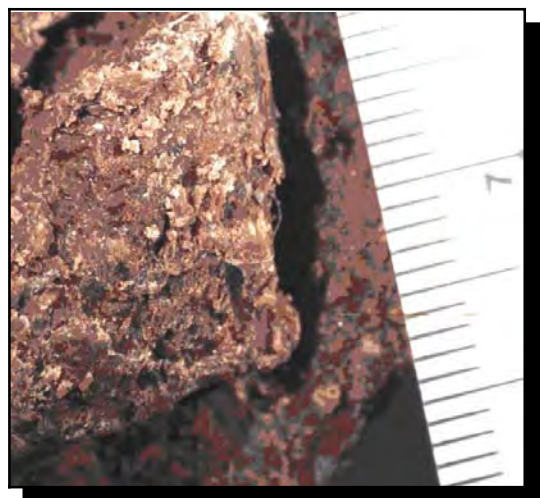
#### **PSILOCYBIN MUSHROOM CHOCOLATES IN CLARA COUNTY, CALIFORNIA**

The Santa Clara County Crime Laboratory (San Jose, California) recently received a polydrug submission which included its first exhibits of chocolate/psilocybin mushroom "candies". The seizures were made by the Mountain View Police Department at a rock concert. The five chocolates were star-shaped, wrapped in colored foil (four in silver, one in gold), and weighed between 12 and 15 grams each (see Photo 1). Pieces of mushrooms were visible throughout the chocolates (see Photo 2). Soaking one full gram of the concoction in 0.2N H<sub>2</sub>SO<sub>4</sub>, multiply washing with methylene chloride, basifying the solution, and extraction into n-butyl chloride gave a clean psilocin peak by GC/MS. No quantitation was performed. This case also included a small amount of mushroom stems (by themselves), which also analyzed positive for psilocin (not quantitated). Finally, two ziploc bags containing an unknown white powder (suspected Ecstasy) were submitted (total net mass 1.89 grams). Analysis by color testing and FTIR confirmed 3,4-methylenedioxymethamphetamine (MDMA, not quantitated). The submission of MDMA in powdered form (rather than as tablets) has not occurred in Santa Clara County for several years.

[Editor's Notes: Previous seizures of psilocybin mushroom chocolates were detailed in the May and June 2003 issues of *Microgram Bulletin*. Again, all subscribers are reminded that the DEA Dangerous Drugs Strategic Intelligence Unit (NTSG) and the National Drug Intelligence Center (NDIC) remain



**Photo 1**



**Photo 2**

interested in this issue. Subscribers encountering these concoctions are asked to forward details to NTSG by FAX to 202/307-7916, Attn: J. Hines; and to NDIC by email to <[ronald.strong2@usdoj.gov](mailto:ronald.strong2@usdoj.gov)>.]

\* \* \* \* \*

**- INTELLIGENCE ALERT -**

**LIQUID COCAINE INSIDE THE LININGS OF PLASTIC MUGS  
IN MIAMI, FLORIDA**

The DEA Southeast Laboratory (Miami, Florida) recently received six colored acrylic/plastic mugs containing liquid inside the linings, suspected liquid cocaine (see Photo 3). The mugs (three gray/blue, two clear, and one red/pink) were contained in an express mail package, and were intercepted by DEA Miami at the Miami International Airport Foreign Mail Facility. Analysis of the liquid (total net volume 1331 milliliters) by GC, GC/MS, IR, color testing, and anion testing confirmed 53 percent cocaine hydrochloride (610 milligrams/milliliter). This is the first encounter with this type of smuggling technique by the Southeast Laboratory.



**Photo 3**

\* \* \* \* \*

**- INTELLIGENCE BRIEF -**

**“FOXY-METHOXY” TABLETS IN SALEM, OREGON**

The Oregon State Police Forensic Laboratory (Springfield, Oregon) recently received a polydrug submission consisting of numerous 0.2 gram bindles of cocaine and four tablets of suspected Ecstasy (MDMA). The exhibits were seized near a high school by the Salem Police Department. The tablets (total net mass 0.95 grams) were 9 millimeters in diameter, off-white with pink

speckles, and had a spider logo on one face and two dimples on the opposite face (see Photo 4). Analysis by color testing and GC/MS, however, indicated not MDMA but rather 5-methoxy-N,N-diisopropyltryptamine (5-MeO-DIPT), sometimes referred to as "Foxy" or "Foxy-Methoxy" (not quantitated). This is the third time this substance has been seen by the Oregon State Police Forensic Division, the other times being at the Portland and Central Point laboratories.

[Editor's Notes: According to the analyst, the Portland submission also had a spider logo, but was a salmon/pink color and lacked the double dimple on the opposite tablet face. The Central Point submission (reported in *Microgram* 2001;34(11):290) was a tan powder.]



**Photo 4**

\* \* \* \* \*

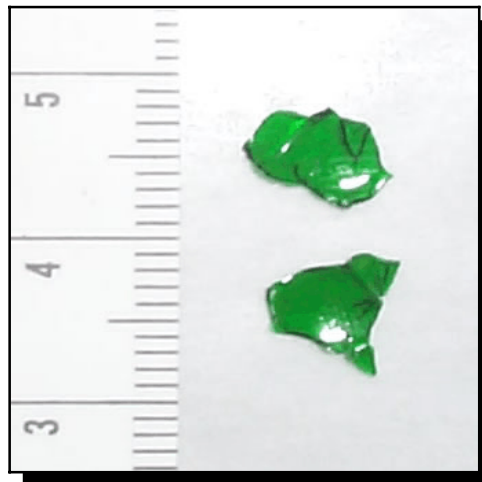
## **- INTELLIGENCE BRIEF -**

### **5-METHOXY-*ALPHA*-METHYLTRYPTAMINE IN MESA, ARIZONA**

The City of Mesa Police Department Crime Laboratory (Mesa, Arizona) recently received a unusual submission consisting of six small plastic zip-lock style bags (imprinted with green marijuana leaf logos), each containing approximately 32 milligrams of a hard, brittle, and deep green colored material that appeared to be pieces of broken glass or plastic, each approximately 0.5 - 1.0 cm in size, suspected LSD (see Photos 5 and 6). The exhibits were seized by the City of Mesa Police Department as a result of a traffic stop. The material would not dissolve in water, and preliminary color tests (Marquis, cobalt thiocyanate, sodium nitroprusside, Froehde's, and p-DMBA) were negative or inconclusive. Analysis of a hexane/ethanol extract by GC/MS indicated 5-methoxy-*alpha*-methyltryptamine (5-MeO-AMT), as published in the May 2003 issue of *Microgram Bulletin* (page 96). Quantitation was not performed. This was the first encounter with this substance at the Mesa Crime Laboratory.



**Photo 5**



**Photo 6**



**- INTELLIGENCE BRIEF -**

***SALVIA DIVINORUM* IN MIAMI-DADE COUNTY, FLORIDA**

The Miami-Dade Police Department Crime Laboratory Bureau (Miami, Florida) recently received a submission of 0.4 grams of dried, partially crushed plant material, dark green in color, suspected *Salvia Divinorum* (see Photo 7). The material was seized by a Miami-Dade County Public Schools police officer from a student. Microscopic examination showed none of the characteristics of marijuana, and the modified Duquenois-Levine test gave a wine-red color that did not transfer to chloroform. Extraction following the procedure by Giroud, et al. (*Forensic Science International* 2000;112(2-3):143) followed by GC/MS analysis confirmed salvinorin A, the psychoactive component in



**Photo 7**

*salvia divinorum*. Purchased *salvia divinorum* containing artificially enhanced concentrations of salvinorin A (10X) was used as a comparison standard, and was extracted and analyzed in the same manner. This is the Crime Laboratory's first encounter with this material.

[Editor's Notes: This is the first mention (in *Microgram Bulletin*) of *salvia divinorum* containing artificially enhanced concentrations of salvinorin A. According to the analyst, the source now provides *salvia divinorum* containing up to 15X enhancement of salvinorin A. Further details not provided in accordance with Journal policy (crime laboratories with a legitimate need to know may contact the Editor for additional information). A comprehensive Selected Intelligence Brief on *Salvia Divinorum* (published by the National Drug Intelligence Center (NDIC)) was reprinted in the June 2003 issue of *Microgram Bulletin*.]

\* \* \* \* \*

**- INTELLIGENCE BRIEF -**

***SALVIA DIVINORUM* IN ROCHESTER, MINNESOTA**

The Minnesota Bureau of Criminal Apprehension Forensic Science Laboratory (St. Paul, Minnesota) recently received a submission of approximately one ounce of small fragments of a green leafy plant material, suspected *Salvia Divinorum* (see Photo 8, next page). The exhibit was seized by the Rochester Police Department as a result of a DWI traffic stop (Rochester is located in southeastern Minnesota). The suspect claimed to have purchased the material on a street corner for \$50. A microscopic examination revealed no characteristics similar to marijuana. Analysis of a methanol extract by GC/MS gave poor results; however, analysis of a chloroform extract confirmed salvinorin A. A sample of *salvia divinorum* (bought at a local

“head shop”) was used as a comparison standard. Quantitation was not performed. The Rochester Police Department had been receiving information about *salvia divinorum* in their area; however, this was the Forensic Science Laboratory’s first encounter with this material.

[Editor’s Notes: The analyst in the above case indicated that extraction with methanol gave unsatisfactory results, and that a “chloroform soak” was required in order to extract salvinorin A from *salvia divinorum*. Similarly, the DEA North Central Laboratory also reported poor results with attempted methanol extraction, and used a 10 minute extraction with boiling chloroform in order to extract salvinorin A from *salvia divinorum* (as reported in the July 2003 issue of *Microgram Bulletin*). These findings suggest that chloroform (preferably hot) should be substituted for methanol as the standard extraction solvent for analysis of *salvia divinorum*.]



**Photo 8**

\* \* \* \* \*

#### **- INTELLIGENCE BRIEF -**

#### **MIXED *l*- AND *d*-METHAMPHETAMINE / MDMA TABLETS IN PHILADELPHIA, PENNSYLVANIA**

The DEA Northeast Laboratory (New York, New York) recently received a polydrug submission which included 86 tan colored tablets with a Kangaroo logo on one face and a half-score on the opposite face, total net mass 15.4 grams, suspected Ecstasy (see Photo 9). The tablets were purchased in Philadelphia by the DEA Philadelphia Division. Analysis by GC/IRD, GC/MSD, FTIR, HPLC, CE, and also GC/MS after TFAP derivatization, indicated 28 mg of methamphetamine and 21 mg of 3,4-methylenedioxymethamphetamine (MDMA) per tablet (salt forms not determined). Unusually, the isomeric composition of the methamphetamine was approximately 87 percent *l*- and 13 percent *d*-. This is the first time the Northeast Laboratory has encountered *l*-methamphetamine with MDMA in an ecstasy tablet.



**Photo 9**



**- INTELLIGENCE ALERT -**

**BLACK TAR HEROIN AND METHAMPHETAMINE IN CANS  
AT LOS ANGELES INTERNATIONAL AIRPORT**

The DEA Southwest Laboratory (Vista, California) recently received a box containing nineteen 32 ounce (approximate) food cans of “Chongos Zamoranos Tres Reyes”, a curdled milk dessert (see Photo 10). The box was seized by the US Customs Service from a passenger arriving at the Los Angeles International Airport. The cans had been recrimped at one end; opening them revealed packages wrapped in brown tape and cellophane (see Photo 11). Eleven of the packages contained a black, tarry substance, total net mass 7587 grams, suspected heroin. The remaining eight cans contained a slushy white substance, total net mass (after solvent evaporation over 24 hours) 3228 grams, suspected methamphetamine. Analysis of a composite of the black tar samples by color testing, GC, IR, and MS confirmed 6.1 percent heroin and approximately an equal percentage of O6-monoacetylmorphine (salt forms not determined). Analysis of a composite of the dried white material by color testing, GC, and LC confirmed 89 percent *d*-methamphetamine hydrochloride. The removed solvent was identified as toluene.



**Photo 10**



**Photo 11**

**- INTELLIGENCE BRIEF -**

**DEXTROMETHORPHAN TABLETS IN BALLSTON SPA, NEW YORK**

The New York State Police Forensic Investigation Center (Albany, New York) recently received fifteen plastic bags containing a total of 1467 round, unmarked, white tablets, total net mass 654 grams, suspected Ecstasy (photos not taken). The exhibits were seized by the New York State Police as a result of an undercover sale and subsequent search warrant in Ballston Spa (located about 20 miles north of Albany). Analysis by color testing, TLC, FTIR, GC/MSD, and crystal testing, however, indicated not MDMA but rather dextromethorphan, a non-controlled substance (quantitation not performed). Dextromethorphan is rarely encountered in this laboratory, especially in such a large quantity.

\* \* \* \* \*

**FOLLOWUP TO:**

**CLARIFICATION OF LISTING OF “TETRAHYDROCANNABINOLS” IN SCHEDULE I AND EXEMPTION FROM CONTROL OF CERTAIN INDUSTRIAL PRODUCTS AND MATERIALS DERIVED FROM THE CANNABIS PLANT; FINAL RULES**

[As reprinted in *Microgram Bulletin* 2003;36(6):125]

The final rules are currently the subject of litigation in the United States Court of Appeals for the Ninth Circuit. The case is Hemp Industries Association, et al. v. Drug Enforcement Administration, No. 03-71366.

\* \* \* \* \*

## **Selected Intelligence Brief**

### **PCP: The Threat Remains**

**DEA Intelligence Division  
Office of Strategic Intelligence  
Domestic Strategic Intelligence Unit and Dangerous Drugs Strategic Intelligence Unit**

**202/307-8726**

[Unclassified; Reprinted With Permission]

#### **Overview**

Since its emergence as a drug of abuse in the late 1960s, phencyclidine (PCP) has been described as one of the most dangerous of all synthetic hallucinogens. Its niche in the drug world is usually one characterized by abusers exhibiting hostile behavior that manifests itself in extremely violent episodes.

Despite the negative effects associated with PCP, there remains an illicit market for the drug. Illicit organizations producing and distributing PCP are still active in the United States. These organizations, composed primarily of African-Americans operating mainly in Los Angeles, and, to a lesser extent, in Houston, supply most of the PCP available in the nation. The recent emergence of large PCP laboratories in other locations, such as Indiana and Maryland, are cause for concern because this may be an indication that the demand for PCP is on the rise. Lending support to this claim is a Drug Abuse Warning Network (DAWN) survey indicating that the number of PCP-related emergency room (ER) visits has increased 78 percent from 1998 to 2001; however, it is still too early to determine if PCP will return as a significant drug of abuse.



**PCP in tablet form is commonly sold under the guise of MDMA**

#### **Background**

Although PCP was first synthesized in 1926, it was not until the mid-1950s that the pharmaceutical company Parke-Davis began to investigate PCP's use as a human anesthetic. In 1963, PCP was patented and marketed in the United States as a surgical analgesic and anesthetic under the trade name Sernyl. However, due to adverse collateral symptoms (i.e., severe confusion, agitation, delusion, and irrational behavior), Sernyl was withdrawn from the market in 1965. PCP was subsequently marketed in 1967 as a veterinary anesthetic and tranquilizer under the trade name Sernylan. Also in 1967, the first reported illicit use of PCP occurred in the Haight-Ashbury District in San Francisco. In January 1978, PCP was transferred from Schedule III to Schedule II under the Controlled Substances Act of 1970.

## Forms, Effects, and Methods of Administration

PCP is available in powder, crystal, tablet, capsule, and liquid forms, and can be abused by snorting, smoking, or swallowing the drug. Smoking PCP is the most common method of abuse. Abusers typically saturate leafy material, such as mint, parsley, oregano, tobacco, or marijuana, with PCP, and then roll the saturated material into a cigarette called a joint. Another variation on this theme is effected by dipping cigarettes or marijuana joints in liquid PCP. Powder/crystal PCP, also known as Angel Dust, also can be smoked by abusers when it is mixed with marijuana and/or tobacco. However, this is a less favored method because of "hot spots" created by the uneven distribution of powder throughout the joint.



**PCP in liquid form**

On the street, PCP is commonly referred to as Angel Dust, Hog, Ozone, Rocket Fuel, Shermans, Wack, Crystal, and Embalming Fluid. PCP combined with marijuana is referred to as Killer Joints, Super Grass, Fry, Lovelies, Wets, and Waters. Today, PCP joints are often referred to as "dippers" because users dip the joints into a PCP-laced liquid referred to as "water."

The onset of PCP's effects varies with the route of administration. PCP abusers usually begin to feel the effects of the drug within 2 to 5 minutes after smoking it, and within 30 to 60 minutes after oral ingestion. The "time-to-peak" effect also varies with the route of administration, but the "peak" usually occurs after 15 to 30 minutes for smoking, and from 1½ to 2½ hours after oral ingestion. PCP intoxication may last between 4 and 8 hours when consuming a recreational dose, although some users report subjective effects for between 24 and 48 hours.

PCP is known as a "dissociative anesthetic" because it distorts perceptions of sight and sound and produces feelings of detachment, i.e., dissociation from one's environment and one's self. The effects of PCP also vary depending on the dosage. Low-to-moderate doses—from 1 to 5 milligrams (mg)—often cause the user to feel detached, distant, and estranged from his surroundings. Other effects can include numbness, slurred speech, and loss of coordination that at the same time may be accompanied by a sense of strength and invulnerability. A blank stare, involuntary rapid eye movements, and an exaggerated gait also are observable effects. High doses of PCP (10 mg or more) produce illusions and auditory hallucination. PCP may cause acute anxiety and a feeling of impending doom in some users; in others, paranoia and violent hostility. In addition, in some users the drug may produce effects that mimic symptoms of schizophrenia, such as delusions, paranoia, catatonia, disordered thinking, and a sensation of distance from one's environment.

Individuals on PCP often have been observed committing violent uncontrolled acts toward other people; however, there is no scientific basis that PCP specifically causes violent or criminal behavior.

Chronic abuse of PCP can impair memory and thinking. The user can have persistent speech difficulties, such as slurred speech or stuttering, inability to articulate, and inability to speak. Other symptoms associated with long-term use include suicidal thoughts, anxiety, depression, social withdrawal, and social isolation. PCP has not been proven to be physically addictive, but it can lead to psychological dependence, craving, and compulsive addictive behavior.

## Evolution of Abuse

PCP first appeared on the streets of San Francisco in 1967, mainly in tablet form. Often it was sold under the name of other popular hallucinogens, such as LSD, MDA, mescaline, and THC. The acronym PCP is believed to have been derived from the phrase "Peace Pills" (PeaCe Pills). By 1968, PCP abuse briefly escalated with the drug becoming available in other major cities including Chicago, Miami, New York City, and Philadelphia. It was sold under the names Crystal, Angel Dust, and Hog. PCP abuse subsequently waned throughout the 1970s until the early 1980s, when abuse rose again-particularly among teenagers in the cities of Baltimore, Chicago, Detroit, Los Angeles, New Orleans, New York City, San Diego, San Francisco, St. Louis, and Washington, DC. It is believed that the widespread abuse and availability of crack cocaine in the late 1980s and early 1990s reduced the demand for PCP. Presently, PCP is considered a "club drug" because of its synthetic manufacture and abuse by some individuals involved in the "rave culture." However, it is important to note that PCP abuse at rave events and nightclubs is not widespread.

## Abuse Indicators

Current data from drug abuse surveys provide conflicting information relative to PCP abuse. According to DAWN, the number of PCP-related ER visits has increased 78 percent from 1998 to 2001 (from 3,436 to 6,102 visits). In 2001, ER visits involving PCP significantly increased in Philadelphia, and Washington, DC. Of note, PCP ER mentions in Chicago dropped to 874 in 2001 from its previous 6-year high of 1,003 in 2000.

PCP ER Mentions 1998 - 2001			
1998	1999	2000	2001
3,436	3,663	5,404	6,102

SOURCE: DAWN

Preliminary DAWN 2002 data indicate that the number of PCP-related ER visits remained close to those seen in 2001. DAWN estimated that there were 3,257 PCP-related ER visits in the first 6 months of 2002, compared to 3,028 in the last 6 months of 2001. During the first half of 2002, the number of ER visits involving PCP remained stable in Washington, DC, and Los Angeles, but rose by almost 40 percent in Philadelphia, from 407 to 569. PCP ER mentions in Chicago continued to decline, decreasing by approximately 31 percent, from 355 to 244.

On the other hand, data from the National Household Survey on Drug Abuse indicated that past year use of PCP among the U.S. population (persons aged 12 or older) remained stable from 2000 to 2001. There was only a slight increase in past year use among adults aged 18 to 25, from 0.3 to 0.4 percent between 2000 and 2001. Among adults aged 26 and older, there was no measurable past year use. In addition, past year use among youths aged 12 to 17 remained unchanged between 2000 and 2001 at 0.5 percent. In addition, data from the Monitoring the Future Survey indicated that PCP use among high school seniors decreased from 2.3 percent in 2000 to 1.8 percent in 2001. (PCP abuse data are available for high school seniors only.)



Rates of PCP use detected through the urinalysis of male and female arrestees, as reported by the Arrestee Drug Abuse Monitoring Program, were relatively low in 2000 compared to marijuana, cocaine, heroin, and methamphetamine. Cities having the highest positive test results for PCP among male arrestees were Cleveland (8.1%), Oklahoma City (5.2%), Houston (4.8%), and Dallas (3.9%). Cities having the highest positive test results for PCP among female arrestees were Cleveland (4.5%), Oklahoma City (4.5%), Seattle (4.3%), and Philadelphia (3.7%). In most cities, male and female arrestees who tested positive for PCP were primarily African-American. It is important to note that Hispanic male and female arrestees in San Jose and Las Vegas as well as Caucasian male arrestees in Philadelphia tested positive for PCP more frequently than did African-American arrestees.

## Manufacture

The Los Angeles area is the primary source for the majority of PCP found in the United States. According to the El Paso Intelligence Center (EPIC) Clandestine Laboratory Database, 17 of the 24 PCP laboratories seized throughout the United States from 1998 to 2002 were located in California. As they have for decades, African-American organizations and street gangs, operating primarily in Los Angeles and San Bernardino County, produce most of the PCP available nationwide. These groups typically produce PCP in liquid form and subsequently handle the wholesale distribution of the drug to mid-level distributors in Chicago, Houston, Los Angeles, Milwaukee, New Orleans, Newark, New York City, Philadelphia, and Washington, DC. It has been determined that some of the individuals involved with these organizations were formerly part of PCP trafficking groups and street gangs that have operated in the Los Angeles area since the late 1980s and early 1990s. In July 2002, and, more recently, in February 2003, the DEA and the Southern California High Intensity Drug Trafficking Area (HIDTA) seized two operational PCP laboratories in the Los Angeles area. These laboratories were operated by African-American members of a Los Angeles-based PCP trafficking organization.

### Methodology

PCP is relatively easy to manufacture and is commonly produced in liquid form via the "bucket method." This method, in which chemicals are mixed in either a bucket or trash bin to produce liquid PCP, requires approximately eight to ten hours to complete. Although easy to manufacture, it is extremely dangerous to produce PCP because most of the chemicals are toxic as well as highly flammable.

PCP is also produced by Mexican drug trafficking organizations operating in the United States. These organizations typically produce PCP in powder or crystal form versus the liquid form normally produced by African-American organizations. In addition, these organizations are suspected of distributing wholesale quantities of PCP powder to Hispanic street gangs and other distributors in San Jose, New York City, and various locations in Oklahoma. In 2001, a clandestine laboratory that produced PCP in powder and crystal form was seized in San Jose. A Mexican national serving as a laboratory operator in San Jose was recently released from prison, having served time for prior PCP-related offenses.

In California, independent operators have, for many years, been suspected of producing PCP. Because these operators normally produce small amounts of PCP for personal use and/or localized distribution, they are usually of little significance. However, in 2001, a large clandestine laboratory that produced crystal PCP was seized in California's Mariposa County. The Caucasian operators of this laboratory,



described as "biker-types," appeared to be operating independently from other PCP trafficking organizations. As in the case of the San Jose laboratory, one of the operators of this laboratory was recently released from prison for prior drug-related offenses.

Despite California being the primary production area, significant PCP production operations recently have been found in Baltimore, Maryland, and Gary, Indiana. In November 2002, an operational PCP laboratory was seized at a residence in Baltimore. It was one of the largest PCP laboratories ever seized on the East Coast, as it contained an enormous amount of chemicals consistent with the manufacture of PCP and approximately 4 gallons of finished product. The African-American operators of the laboratory apparently intended to lace marijuana with PCP to increase its marketability and profit margin. In December 2001, federal, state, and local law enforcement authorities disrupted an organization, responsible for the manufacture and wholesale distribution of PCP in Gary, and arrested many of its African-Americans members. This organization had been producing PCP for several years-primarily supplying a Chicago-based street gang.



**PCP production via the bucket method**

### PCP Laboratory Seizures 1998 - 2002

1998	1999	2000	2001	2002
5	5	4	4	6

SOURCE: EPIC

### Chemical Sources

Precursors, reagents, and solvents used to manufacture PCP are obtained primarily from sources in California. Other sources of supply have been identified in Connecticut, Indiana, Maryland, Nevada, Oklahoma, and Texas. In most cases, the precursors are obtained from legitimate commercial and bulk chemical companies under false pretenses. The use of falsified information is a popular method of deception. For example, one illicit organization alleged that the chemicals were to be used for industrial cleaning purposes. PCP traffickers are known for establishing "front" companies for the sole purpose of obtaining chemicals necessary for the production of PCP as well as other illicit synthetic drugs. The PCP laboratory seized recently in Baltimore had obtained chemicals from a company in Maryland that had been set up by the laboratory operators.

### Distribution

New York City is one of the largest mid-level distribution hubs for PCP, usually obtained from wholesale producers and distributors in the Los Angeles area. Much of the PCP seized from retail distributors in Philadelphia, Newark, and New England is obtained from mid-level distributors operating in New York

City. Belizean, and to a lesser extent, African-American organizations appear to control much of the PCP distribution in New York City. In addition, the New York City Police Department reports that many members of local street gangs are actively involved in the retail distribution of PCP as well as other illicit drugs, such as heroin and cocaine.

Since the early 1990s, groups of Belizean nationals operating in the United States have been acting as the PCP distribution middlemen between Los Angeles-based street gangs and African-American distribution organizations in New York City. Evidence indicates that Belizean nationals have expanded their operations by establishing their own mid-level distribution organizations in New York City. These distribution organizations still obtain and transport PCP from wholesale distributors in the Los Angeles area. Since 2001, several Belizean nationals have been arrested while transporting PCP from sources in Los Angeles to the New York area. In March 2001, there were two significant PCP seizures involving Belizean nationals who were transporting multikilogram quantities at the Los Angeles and Phoenix International Airports. In February and March 2002, Belizean nationals arrested at train stations in Albuquerque and Los Angeles also were in possession of multikilogram quantities of PCP.



**PCP is commonly transported in plastic beverage containers**

Street gangs control much of the mid-level and retail distribution of PCP in Los Angeles, Las Vegas, and Chicago. Since the early 1980s, Los Angeles-based street gangs, such as the Crips, have been responsible for both the production and distribution of PCP. In fact, these gangs are the primary suppliers of PCP and other drugs to smaller local gangs operating throughout Los Angeles. DEA reporting indicates that some of these Los Angeles-based gangs currently are sending multiounce quantities of PCP by courier and/or mail services to distributors in Cleveland, Dallas, and Las Vegas. In Chicago, most of the PCP distribution is controlled by a local street gang, which was formed in the 1960s. In December 2001, the laboratory responsible for supplying this gang was seized in Indiana. In May 2002, the DEA Chicago Field Division subsequently arrested several individuals in Chicago who were connected to this laboratory.

Many PCP distributors in Houston, Omaha, Kansas City, and Washington, DC, have links to major PCP trafficking organizations operating in the Los Angeles area. In Houston, some distributors are supplied directly with PCP while others are supplied with PCP-related products that must be further converted to an ingestible form of PCP. In Washington State, mid-level and retail distributors of PCP maintain connections to sources of supply in southern California. However, other user groups, such as those affiliated with Outlaw Motorcycle Gang activity or the rave scene, tend to have local and/or East Coast sources of supply in New York City, Newark, and Philadelphia.

Distribution of PCP also is an emerging problem in Omaha and Kansas City. In December 2001, authorities arrested a PCP and marijuana distributor and seized 20 ounces of PCP in Omaha. Authorities believe that the PCP was obtained from West Coast suppliers, and was going to be used to soak marijuana cigarettes. In Kansas City, authorities arrested two individuals following the seizure of approximately 32 kilograms of PCP from their residences.

## Transportation and Seizures

Since 2000, seizures of PCP and related products while in transit have occurred in Arizona, California, Kansas, Maryland, Missouri, New Mexico, Oklahoma, Texas, and Washington, DC. Most of the PCP seized originated in the Los Angeles area and was destined for the major metropolitan areas of Chicago, Dallas, Oklahoma City, St. Louis, New York City, and Washington, DC. As with other illicit drugs, PCP is shipped via mail services and by couriers aboard trains, buses, airplanes, and automobiles. PCP commonly is transported in plastic and glass beverage containers that are typically used for fruit, herbal, and sports-related drinks. Seizures of liquid PCP from both couriers and mail parcels usually are less than 2 gallons; however, larger seizures are not uncommon. In October 2002, law enforcement authorities in both Texas and Oklahoma made 4-gallon PCP seizures of PCP from individuals traveling by vehicle from California.

## Prices

PCP-laced cigarettes and joints reportedly sell between \$5 and \$30 each. PCP is available in tablet form costing from \$20 to \$30, although availability is limited. Usually the tablet form is sold as MDMA, also known as Ecstasy. PCP also is available in powder and liquid forms, selling for between \$20 and \$30 per gram, and for between \$125 and \$1,000 per liquid ounce. At the wholesale level, gallon quantities of liquid PCP sell for between \$6,500 and \$8,000 in Los Angeles, and between \$12,000 and \$20,000 in New York City.

## Conclusion

At this point, it is still too early to determine if PCP is going to reemerge as a significant drug of abuse. However, there are indications of a PCP resurgence. Recent large seizures of the drug, coupled with the discovery of clandestine laboratories operating outside of traditional source areas, may be an indication that demand for PCP is increasing. Even though the trafficking and abuse of PCP is not as widespread as with other illicit drugs, the violent consequences of its abuse are always causes for concern.

\* \* \* \* \*

## SELECTED REFERENCES

[Note: Selected references are a compilation of recent publications of presumed interest to forensic chemists. Unless otherwise stated, all listed citations are published in English. If available, the email address for the primary author is provided as the contact information. Listed mailing address information (which is sometimes cryptic or incomplete) exactly duplicates that provided by the abstracting services.]

1. Reddy MM, Suresh V, Jayashanker G, Rao BS, Sarin RK. **Application of capillary zone electrophoresis in the separation and determination of the principal gum opium alkaloids.** Electrophoresis 2003;24(9):1437. [Editor's Notes: The presented method does not require sample purification or derivatization. Contact: Central Forensic Science Laboratory, Bureau of Police Research & Development, Ministry of Home Affairs, Government of India, Ramanthapur 500 013, India.]
2. Cole MD, Lea C, Oxley N. **4-Bromo-2,5-dimethoxyphenethylamine (2C-B): A review of the public domain literature.** Science & Justice 2002;42(4):223. [Editor's Notes: Presents a

review of the identification and quantitation of 2C-B. Contact: Dept. of Forensic Science and Chemistry, Anglia Polytechnic University, Cambridge, UK CB1 1PT.]

3. Aalberg L, DeRuiter J, Noggle FT, Sippola E, Clark CR. **Chromatographic and spectroscopic methods of identification for the side-chain regioisomers of 3,4-methylenedioxyphenethylamines related to MDEA, MDMMA, and MBDB.** Journal of Chromatographic Science 2003;41(5):227. [Editor's Notes: Presents the synthesis and GC and GC/MS analyses of ten closely related 3,4-methylenedioxyphenethylamines all having a molecular weight of 207. Contact: School of Pharmacy, Department of Pharmacal [sic] Sciences, Auburn University, Auburn, AL 36849.]
4. Rothchild R. **Identification of a heroin diluent: One- and two-dimensional proton and carbon-13 NMR studies of procaine hydrochloride: Computational studies of procaine and its conjugate acid.** Spectroscopy Letters 2003;36(1&2):35. [Editor's Notes: Presents the isolation (from a street sample of heroin) and identification of the title compound, and also presents *ab initio* molecular modeling calculations. Contact: John Jay College of Criminal Justice, Science Department, The City University of New York, NY 10019.]
5. Willers LJ. **The detection of phosphine gas produced from hydriodic acid and the evaluation of detection instruments for use in clandestine laboratory environments.** Journal of the Clandestine Laboratory Investigating Chemists Association 2003;13(2):14. [Editor's Notes: Presents a comprehensive overview of the problem and a detailed evaluation of a number of electronic detection devices. Contact: Los Angeles County Sheriff's Department, Scientific Services Bureau, 2020 W. Beverly Blvd., Los Angeles, CA 90057.]
6. Tavares MFM, Jager AV, da Silva CL, Moraes EP, Pereira EA, de Lima EC, Fonseca FN, Tonin FG, Micke GA, Santos MR, de Oliveira MAL, de Moraes MdLL, van Kampen MH, Fujiya NM. **Applications of capillary electrophoresis to the analysis of compounds of clinical, forensic, cosmetological, environmental, nutritional and pharmaceutical importance.** Journal of the Brazilian Chemical Society 2003;14(2):281. [Editor's Notes: The utility of CE across a variety of disciplines is presented. Contact: Instituto de Quimica, Universidade de Sao Paulo, CP 26077, Sao Paulo - SP 05513-970, Brazil.]
7. Iwata YT, Kanamori T, Ohmae Y, Tsujikawa K, Inoue H, Kishi T. **Chiral analysis of amphetamine-type stimulants using reversed-polarity capillary electrophoresis/positive ion electrospray ionization tandem mass spectrometry.** Electrophoresis 2003;24(11):1770. [Editor's Notes: Presents the specialized CE/MS-MS analyses of a variety of ATS's, ranging from precursor ephedrine to methylenedioxy-substituted drugs. Contact: National Research Institute of Police Science, Chiba, Japan.]
8. Janusz A, Kirkbride KP, Scott TL, Naidu R, Perkins MV, Megharaj M. **Microbial degradation of illicit drugs, their precursors, and manufacturing by-products: Implications for clandestine laboratory investigation and environmental assessment.** Forensic Science International 2003;134(1):62. [Editor's Notes: Presents a study of the environmental degradation of phenylacetone and methamphetamine sulfate at clandestine laboratory dumpsites (in Australia). Contact: Physics and Earth Sciences, School of Chemistry, Flinders University of South Australia, Bedford Park, Australia.]
9. Herraiz-Hernandez R, Campins-Falco P, Verdu-Andres J. **Strategies for the enantiomeric determination of amphetamine and related compounds by liquid chromatography.** Journal

- of Biochemical and Biophysical Methods 2002;54(1-3):147. [Editor's Notes: Presents a review of recent advances in the title field, with an emphasis on biological samples. Contact: Departamento de Quimica Analitica, Facultad de Quimica, Universitat de Valencia, Burjassot, Valencia, Spain 46100.]
10. Sullivan D, Wehrmann J, Schmitz J, Crowley R, Eberhard J. **Determination of ephedra alkaloids by liquid chromatography/tandem mass spectrometry.** Journal of AOAC International 2003;86(3):471. [Editor's Notes: Presents an LC-MS/MS methodology for determination of six major ephedra alkaloids in various substrates, ranging from raw ephedra to a high-protein drink mix containing ephedra. Contact: [darryl.sullivan@covance.com](mailto:darryl.sullivan@covance.com)]
  11. Glattstein O, Glattstein B. **A method for the detection of compounds comprising methylenedioxyphenyl and testing kit for the same.** PCT Int. Appl. WO 2003052426 A1 26 Jun 2003, 22 pp. CLASS: ICM: G01N033-94. APPLICATION: WO 2002-IL1024 19 Dec 2002. PRIORITY: IL 2001-147185 19 Dec 2001. [Editor's Notes: The abstract did not provide specifics on the testing reagents. Contact: Israel (No further addressing information was provided).]
  12. Hu Y, Li L, Han H. **HPLC determination of loureirin A and B in Dragon's Blood.** Yaowu Fenxi Zazhi 2003;23(1):7. [Editor's Notes: Presents an HPLC/UV method for detection of the title compounds. This article is written in Chinese. Contact: Medical College of Chinese People's Armed Forces Police, Tianjin 300162, Peop. Rep. China.]

#### Additional References of Possible Interest:

1. Lora-Tamayo C, Tena T, Rodriguez A, Sancho JR, Molina E. **Intoxication due to 1,4-butanediol.** Forensic Science International 2003;133(3):256. [Editor's Notes: Presents the analysis of a seized sample; however, the primary focus is the toxicological analysis of various biological fluids. Of note, GHB was detected in the biological fluids, resulting from *in vivo* conversion of 1,4-BD. Contact: Ministerio de Justicia. C/ Luis Cabrera, Instituto Nacional de Toxicologia, 9, 28002, Madrid, Spain.]
2. Kueh AJ, Marriott PJ, Wynne PM, Vine JH. **Application of comprehensive two-dimensional gas chromatography to drugs analysis in doping control.** Journal of Chromatography A 2003;1000(1-2):109. [Editor's Notes: Presents a mini-review of GC/GC, followed by an illustrative overview of the technique as applied to forensic toxicology. Contact: GPO Box 2476V, Department of Applied Chemistry, Australian Centre for Research on Separation Science, RMIT University, Vic., Melbourne 3001, Australia.]
3. Speir JP. **Method for the application of FT-MS to drug testing.** U.S. Pat. Appl. Publ. US 20030108876 A1 12 June 2003. CLASS: ICM: C12Q001-68. ICS: G01N033-53; G06F019-00; G01N033-48; G01N033-50. NCL: 435006000; 435007100; 702019000. APPLICATION: US 2001-14279 11 Dec 2001. [Editor's Notes: Presents an FT-MS methodology for analysis of drugs in biological samples. Contact: No contact information was provided.]
4. Burendic E, Penov-Gasi K, Medic-Mejacevic L. **Anabolic-Androgenic steroids.** Hemijski Pregled 2002;43(4):82. [Editor's Notes: Presents a mini-review of the title compounds (not specified), concentrating on their chemistry and biological applications. This article is written in Serbian. Contact: Prir.-Mat. Fak., Inst. Hem., Novi Sad, Yugoslavia.]

5. Herzler M, Herre S, Pragst F. **Selectivity of substance identification by HPLC-DAD in toxicological analysis using a UV spectra library of 2682 compounds.** Journal of Analytical Toxicology 2003;27:233. [Editor's Notes: The UV spectra and relative retention data of 2682 toxicologically relevant compounds is presented. Contact: Institute of Legal Medicine, Humboldt University, Hannoversche Strasse 6, D-10115 Berlin, Germany.]
6. Enculescu AL, Steingra JR. **Raman spectroscopy - A powerful tool for non-routine analysis of pharmaceuticals.** American Pharmaceutical Review 2002;5(1):81. [Editor's Notes: Presents a mini-review of the title technique, with an emphasis on non-routine pharmaceutical samples. Contact: Pfizer Inc., Morris Plains, NJ (no zip code provided).]

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## THE DEA FY - 2003 AND FY - 2004 STATE AND LOCAL FORENSIC CHEMISTS SEMINAR SCHEDULE

The remainder of the FY - 2003 schedule for the DEA's State and Local Forensic Chemists Seminar is as follows:

September 15 – 19, 2003

The FY - 2004 schedule is as follows:

December 8 - 12, 2003  
February 9 - 13, 2004  
April 19 - 23, 2004  
June 14 - 18, 2004  
September 20 - 24, 2004

Note that the school is open only to forensic chemists working for law enforcement agencies, and is intended for chemists who have completed their agency's internal training program and have also been working on the bench for at least one year. There is no tuition charge for this course. The course is held at the AmeriSuites Hotel in Sterling, Virginia (near the Washington/Dulles International Airport). For additional information, eligibility requirements, or to enroll, call 703 668-3337.

\* \* \* \* \*

## EMPLOYMENT OPPORTUNITIES

### 1. State of Connecticut, Department of Public Safety, Scientific Services Division

(Third and Final Posting)

**Position:** Director of Toxicology, Controlled Substances / Toxicology Section

**Location:** Hartford, Connecticut

**Salary Range:** Negotiable

**Application Deadline:** Open Until Filled

**Overview:** The State of Connecticut is offering you that opportunity to create your own vision as Director of the Controlled Substances and Toxicology Laboratory, in the Scientific Services Division, Department of Public Safety, which has one of the most professional and prestigious reputations in the United States. As the Chief Toxicologist, you can focus your energies on directing staff and operations of the laboratory, as administrative responsibilities are shared. Your working environment will be with a highly dedicated and professional staff supported by cutting edge tools and technology.



**Duties:** We are seeking an individual with proven leadership abilities, a passion for research and development, and the ability to complete the laboratory accreditation process. Responsibilities include: Directing staff and scientific operations of a forensic toxicology laboratory; coordinates, plans and manages laboratory programs; formulates program goals and develops laboratory policy; develops and implements techniques necessary to examine chemical and biological evidence; researches new methodology; reviews laboratory findings and supervises report preparation; interprets and administers pertinent laws; trains, supervises and evaluates staff; responds to queries regarding drug effects and chemical actions; serves as expert witness on relevant issues in court cases; and performs related duties as required.

**Qualifications:** A minimum of 10 years experience and training in toxicology and criminalistics in a public health or general toxicology laboratory. Two years of this experience must have been in a supervisory capacity in a major program in forensic toxicology. You must have a comprehensive understanding of the principles and techniques of analytical chemistry (to include infrared and ultra violet spectrophotometry, gas and high performance liquid chromatography, mass spectrometry, and immunoassays). Also, a comprehensive knowledge of the principles of pharmacokinetics and pharmacodynamics is required. Passing an extensive background check is a hiring requirement. The ideal candidate will have a Ph.D. in Toxicology, pharmacology, or related biological or chemical science and will be Board Certified or eligible for Board Certification in Forensic Toxicology.

In addition to a competitive salary, the State of Connecticut total compensation plan includes a generous benefit package worth over 36% of an employees' annual salary. Benefits and options include: A choice of medical and dental plans designed to suit your need, long and short term disability, life insurance, an excellent retirement plan, deferred compensation plan, 12 paid holidays, personal leave days, sick time, and a generous vacation plan. For more information go to: [www.das.state.ct.us](http://www.das.state.ct.us).

**Application Procedures:** Please forward your resume, cover letter and salary requirements to:

Patsy McLaughlin  
Manager of Recruitment  
State of Connecticut  
Department of Administrative Services  
165 Capitol Avenue, R. G-1  
Hartford, CT 06106

\* \* \* \* \*

## **2. Indian River Crime Laboratory**

(Second Posting)

**Position:** Forensic Chemist

**Location:** Fort Pierce, Florida

**Salary:** \$45,000 – \$60,000, Depending on Experience

**Application Deadline:** Open Until Filled

**Duties:** Responsibilities include the analysis of controlled substances; interpretation of laboratory analyses and results; preparation of written reports; and the ability to testify as an expert witness.

**General Requirements:** The applicant must be skilled in using gas chromatography, mass spectroscopy, ultraviolet and infrared spectrophotometry and other drug analysis equipment and methodologies. A familiarity with the technical and safety requirements of ASCLD-LAB, and demonstrated proficiency testing in controlled substance analysis are required. A Master's degree in chemistry or forensic science (with chemistry undergraduate degree) and two years of forensic laboratory experience are preferred. Experience in head-space BAC analysis is desirable. An extensive background investigation is required, and laboratory personnel are subject to random drug testing. EEO.

**Application Procedure:** Applications may be obtained on-line at [www.stluciesheriff.com](http://www.stluciesheriff.com) or by contacting:

Saint Lucie County Sheriff's Office  
Human Resources Department  
4700 W. Midway Road  
Fort Pierce, Florida 34981-4825  
Phone: (772) 462-3206  
Fax: (772) 462-3218

For information about the position, contact:

Daniel C. Nippes (continued next page)

Chief Criminalist  
Indian River Crime Laboratory  
2502 S. 35th Street  
Fort Pierce, Florida 34981  
dnippes@ircc.edu  
Phone: (772) 462-4765

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### 3. Houston Police Department

(First Posting)

**Position:** Crime Laboratory Director

**Location:** City of Houston, Texas

**Salary Range:** \$92,066 - \$100,000 Annually, Dependant on Qualifications

**Application Deadline:** Open Until Filled

**Duties:** Manages the daily operations of the Crime Laboratory, including DNA Analysis, Serology, Toxicology, Drug Identification, Trace evidence analysis, Firearms/Toolmark Examination and evidence registration; will serve as Crime Laboratory Director; hires, supervises and evaluates staff of fifty (50) persons; prepares, administers and monitors division budget; ensures compliance with all federal, state and local laws and regulations regarding physical evidence; oversees development and implementation of standard forensic testing practices and procedures for all sections of Crime Laboratory in accordance with standards set forth by ASCLD-LAB or other appropriate accrediting entity to achieve and maintain laboratory accreditation; plans and implements programs to ensure quality control of laboratory including the generation and storage of laboratory case reports and records; reviews reports and documents concerning evidence analysis and findings; plans directs and oversees the continuous training for all aspects of forensic laboratory services to keep Criminalists up-to-date with all methods of forensic work; works with Investigative Division supervisors to develop protocols for prioritizing laboratory services usage; coordinates division operations with outside agencies and other government agencies; provides physical evidence information to law enforcement agencies, attorneys, judges, the District Attorney's Office and other scientific professionals; reports to an Assistant Chief; performs related duties as required.

**Qualifications:** Educational: Graduation from an accredited college or university with an Advanced Degree and major course of study in Criminalistics, Chemistry or any natural or physical science - or - graduation from an accredited four-year college or university with a major course of study other than one of the described sciences plus fifteen (15) or more years of increasingly complex forensic work experience in a crime laboratory. Experience: Seven (7) years progressively responsible Crime Laboratory experience including two (2) years supervisory experience in an accredited laboratory; or an equivalent combination of education and experience. License: Valid Texas Driver's License and compliance with city's policy on driving (AP 2-2).

**Application Procedures:** Original applications only are accepted and must be received by the Human Resources Department, at 611 Walker, First Floor, Houston, Texas, 77002.

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### 4. Office of the Johnson County Sheriff

THREE POSITIONS

(First Postings)

**Location:** Mission, Kansas (Kansas City metro area)

**Position 1:** Forensic Chemist/Drug Analysis

**Salary Range:** \$50,564.80 to \$72,280.00 Annually, Dependant on Qualifications

**Application Deadline:** Open Until Filled

**Overview:** The Criminalistics Division of the Johnson County Sheriff's Office is seeking a qualified applicant for a position in our Drug Chemistry Section.

**Duties:** The major duties of the position include qualitative analyses using wet chemistry, color reagent tests, microcrystalline tests, and instrumental techniques to identify controlled substances, precursors and other substances used in the preparation and synthesis of illicit drugs.

**Qualifications:** Graduation from an accredited college or university with a bachelor's degree in chemistry or other related physical or biological science and two years of experience in drug chemistry. Applicants must also meet the minimum qualifications of a Deputy Sheriff. The applicant will be required to successfully complete the Kansas Law Enforcement Training Center curriculum. Also, the applicant will be required to successfully complete a laboratory training program in drug chemistry and a competency/proficiency test before beginning independent casework responsibilities.

**Position 2:** Forensic Examiner/Latent Prints

**Salary Range:** \$50,564.80 to \$72,280.00 Annually, Dependant on Qualifications

**Application Deadline:** Open Until Filled

**Overview:** The Johnson County Crime Laboratory, a division of the Johnson County Sheriff's Department, is seeking a qualified applicant for a position in our Latent Print Section.

**Duties:** The major duties of this position include:

- Processing crime scenes to recover latent prints; document and protect evidence following laboratory procedures and maintains chain of custody;
- Select methods, techniques, and instruments to examine and analyze evidence which includes various processing techniques, and obtaining prints from deceased persons;
- Examines latent finger, palm, and foot prints for comparison and identification; writes reports giving conclusions and opinions from observations and test results; prepares exhibits, photographic enlargements and reports for presentation as evidence in court; testifies as an expert witness;
- Enter latent prints into the Automated Fingerprint Identification System (AFIS)

The successful applicant will also be a commissioned Deputy Sheriff.

**Qualifications:** Applicants must have a bachelor's degree and three (3) years of basic latent print experience; however, two (2) additional years of full time experience working with latent print material can be substituted for the bachelor's degree. The three years of basic experience shall include one (1) year of full time experience in filing and searching of inked fingerprints and two (2) years of full time experience in the comparison and identification of latent prints. If the applicant's basic experience does not include one year of experience in classification, filing and searching of fingerprints, then their basic experience must include a minimum of three years full time experience in the comparison and identification of latent print material or related matters.

The successful candidate must also meet the minimum qualifications of a Deputy Sheriff. The successful applicant will be required to successfully complete the Kansas Law Enforcement Training Center curriculum. The successful applicant will be required to successfully complete a latent print competency test prior to assuming independent casework responsibilities.

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**Position 3:** Forensic Chemist/DNA Analyst

**Salary Range:** \$50,564.80 to \$72,280.00 Annually, Dependant on Qualifications

**Application Deadline:** Open Until Filled

**Overview:** The Criminalistics Division of the Johnson County Sheriff's Office is seeking a qualified applicant for a position in our DNA Section. This position will serve as the laboratory's DNA Technical Manager and section coordinator.

**Duties:** The major duties of this position include overseeing the technical operations of the Biology Section to ensure compliance with the American Society of Crime Laboratory Directors/Laboratory Accreditation Board Standards (ASCLD/LAB) as well as the Quality Assurance Standards for Forensic DNA Testing Laboratories standards. In addition, this position will have some casework responsibility; including evaluating the nature, origin and significance of physical evidence both in the laboratory and at crime scenes; performing physical, chemical, biochemical and genetic analysis of biological material associated with evidence using DNA analysis methods; maintaining laboratory records, preparing written technical reports of analysis, and providing effective expert testimony in courts of law. This position will oversee the training of laboratory examiners and the evaluation and implementation of new scientific techniques for the DNA section of the laboratory. The successful applicant will also be a commissioned Deputy Sheriff.

**Qualifications:** Candidates must meet the educational and experience requirements for a DNA Technical Manager as published in Section 5.2 of the Quality Assurance Standards for Forensic DNA Testing Laboratories (U.S. Department of Justice, Federal Bureau of Investigation, 07/15/98). Candidates without a Master's degree must already possess a waiver of the degree requirements as provided in section 5.2.1.1 of the above standards. The successful candidate must also meet the minimum qualifications of a Deputy Sheriff.

The successful applicant will be required to successfully complete the Kansas Law Enforcement Training Center curriculum. Also, the successful applicant will be required to successfully complete a laboratory training program in biology and a qualifying test before beginning independent casework responsibilities.

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**Application Procedures:** Applications for all three positions can be obtained by contacting the Sheriff's Office Personnel

Division at the following address.

Johnson County Sheriff's Office  
Personnel and Training  
125 N. Cherry, Olathe, KS 66061

Phone: (913) 791-5511 or Toll Free: (866) 262-3744

Additional Information about this position can be obtained from Assistant Director Hamm at the Crime Laboratory by calling (913) 826-3209.

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#### **5. Greenwood Police Crime Laboratory**

(First Posting)

**Position:** Forensic Chemist

**Location:** City of Greenwood, Indiana

**Salary Range:** Starting at \$48,435 per Year

**Application Deadline:** Open Until Filled

**Duties:** Responsibilities will include the search, collection, examination and evaluation of scientific evidence; interpretation of laboratory analysis and results; preparation of written reports, and the ability to testify as an expert witness. Ancillary responsibilities include maintenance of laboratory equipment and supplies; management of caseloads and attendance at workshops and seminars as required.

**Qualifications:** The applicant must be skilled in using gas chromatography, mass spectroscopy, ultraviolet and infrared spectrophotometry and other drug screening equipment, and must be able to work independently. Minimum requirements of the position include, but are not limited to: Bachelor's degree in chemistry, biology, forensics or other related scientific field; practical working experience in a forensic laboratory including court testimony as an expert witness; and above average knowledge of and ability to apply scientific methods and disciplines of laboratory testing and analysis.

**Application Procedures:** Applicants should come to the Human Resources Department and complete an application or send/fax their résumé to:

City of Greenwood  
Human Resources Department  
Katie White-Knartzer  
300 S. Madison Ave., Ste. 410  
Greenwood, IN 46142

[hr@cityofgreenwood.com](mailto:hr@cityofgreenwood.com)

Phone: 317-887-5604

Fax: 317-887-5868

Website: [www.cityofgreenwood.com](http://www.cityofgreenwood.com)

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#### **6. Hamilton County Coroner's Crime Laboratory**

(First Posting)

**Position:** Drug Analyst

**Location:** Cincinnati, Ohio

**Salary Range:** \$33,467.00 (Note: Hamilton County has an excellent retirement and benefits program.)

**Application Deadline:** Open Until Filled

**Duties:** Primary responsibility is to analyze and identify controlled substances using GC-MS, FTIR, and other analytical techniques. Analyst is required to present expert testimony in court. Staff members must comply with safety, quality control, technical and administrative procedures required by accrediting agencies. Analysts also routinely instruct law enforcement officers and other criminal justice professionals on matters relating to forensic science.

**Qualifications:** A BS/BA degree in forensic science or related natural science from an accredited college. Applicants must have completed an internship in a forensic laboratory. A strong background in mass spectrometry, pharmaceutical analysis, or analytical chemistry is desirable. Applicants must possess, or be able to obtain, a valid drivers license.

**Application Procedures:** Submit resume with cover letter to the contact listed below. Individuals selected for interviews are responsible for their own travel expenses.

William L. Dean  
Chief of Forensic Sciences  
Hamilton County Coroner's Crime Laboratory  
3159 Eden Ave.  
Cincinnati, Ohio 45219

Phone: 513-946-8755  
E-mail: [bill.dean@hamilton-co.org](mailto:bill.dean@hamilton-co.org)  
Fax: 513-946-8772  
Website: [www.hamilton-co.org/coroner](http://www.hamilton-co.org/coroner)

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## SCIENTIFIC MEETINGS

**1. Title:** 3<sup>rd</sup> European Academy of Forensic Science Triennial Meeting (Third and Final Bimonthly Posting)  
**Sponsoring Organization:** European Academy of Forensic Science  
**Inclusive Dates:** September 22 - 27, 2003  
**Location:** Istanbul, Turkey (Istanbul Convention Centre)  
**Contact Information:** [No Contact Name Provided, +90 212 287-5800 (FAX 263-4581, [eafs2003@enfsi.org](mailto:eafs2003@enfsi.org))]  
**Website:** [[www.eafs2003.enfsi.org](http://www.eafs2003.enfsi.org)]

\* \* \* \* \*

**2. Title:** Clandestine Laboratory Investigating Chemists Association, 13th Annual Technical Training Seminar (Third and Final Posting)  
**Sponsoring Organization:** Clandestine Laboratory Investigating Chemists Association  
**Inclusive Dates:** September 3 - 6, 2003  
**Location:** Richmond, VA (Omni Richmond Hotel)  
**Contact Information:** Two Contacts listed: 1) Roger Ely, 415/744-7051, [rogely@atdial.net](mailto:rogely@atdial.net); 2) Rick Fortune, 804/786-9637, [rfortune@dfs.state.va.us](mailto:rfortune@dfs.state.va.us)  
**Website:** [None]

\* \* \* \* \*

**3. Title:** American Academy of Forensic Sciences - 56th Annual Meeting (First Posting)  
**Sponsoring Organization:** American Academy of Forensic Sciences  
**Inclusive Dates:** February 16 - 21, 2004  
**Location:** Dallas, TX  
**Contact Information:** [See website]  
**Website:** [[www.aafs.org](http://www.aafs.org)]

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**4. Title:** 44th Annual International Drug Conference (First Posting)  
**Sponsoring Organization:** International Narcotic Enforcement Officers Association  
**Inclusive Dates:** October 19 - 25, 2003  
**Location:** Fort Lauderdale, FL (Wyndham Bonaventure Resort and Spa)  
**Contact Information:** [None Listed]  
**Website:** [None Listed]

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# Computer Corner

Enhancing Technical Productivity – Doing More with Less

## #173

by Michael J. Phelan  
DEA Digital Evidence  
Laboratory

Most digital evidence laboratory managers would state that their programs are understaffed. For many organizations, backlogs are usually measured in months. Steadily increasing backlogs and continued understaffing are the norms. Current Federal and state budgets are lean. Deficits are up, and tax revenues are down. Competing priorities within the agency, department, and/or laboratory system itself, can make it very difficult to secure needed resources. And human resources are (usually) the most costly requirement, and therefore the least likely to be satisfied in tight budget times.

### What To Do???

An often overlooked aspect of digital evidence laboratory operations is the opportunity to gain marginal relief through the selective introduction of updated technology. New, more powerful software and hardware are not nearly as expensive as additional employees, especially when training costs and employee benefits are factored into the decision. Here are some ideas to consider as interim measures while awaiting additional staff:

### Software

A very useful advance is purchasing and utilizing at least one comprehensive and unified

digital examination software platform. Examples include Encase from Guidance Software, Forensic Tool Kit from Access Data, Ilook, or the British Vogen software. These platforms only cost from \$600 to \$2,000 per licensed copy, and offer several important productivity benefits, as follows:

First, evidence can be sequentially processed, by scheduling standard examination tasks that can run (unattended) overnight or on weekends. Examples of such tasks include keyword searching, file carving, and compressed file recovery (deconstruction).

Second, there is an immediate synergy benefit in having all members of the examiner staff proficient in the same software. Everyone can build upon the experiences of their fellow examiners. This makes it easier to solve technical problems, and also to run advanced searches using scripts (specialized search programs).

Third, examiner personnel can be teamed if necessary, and cases can also be easily transferred.

Fourth and finally, use of a limited number of software platforms simplifies both the scope of training, qualification testing, and methods validation.

In the larger scheme of laboratory operations, this can result in significant overall time savings – and when you're short-staffed, any time savings boosts productivity.

### Hardware

#### Additional CPU Memory

Another opportunity to enhance examiner productivity involves ensuring that the examiners' workstations have ample computer memory (RAM). Comprehensive examination software platforms are very memory intensive, because they are manipulating a "virtual" copy of the evidence (in the computer's memory) to produce the feel or appearance that there is an operating evidentiary hard drive. While each software vendor will have their own RAM memory recommendations, DEA has found that the workstations with one gigabyte of RAM operate substantially more quickly than the standard 128, 256 or 512 megabytes of RAM. The cost to upgrade a standard computer RAM configuration from 256 megabyte to 1 gigabyte is only \$300 - \$400. The added costs are almost negligible when considering the time savings when executing keyword searches and copying hard drives; i.e., a few hours versus as much as an entire work day.



### **Dual Processing**

Another optimization technique is the purchase and use of dual-processor workstations. Some examination software packages can utilize dual processors to dramatically speed up examinations. Given the labor rates of senior computer forensic examiners, and the falling price of computer hardware, the money spent for a dual processor (\$600 or \$1000) will “break even” after just a few examinations. DEA has begun to collect productivity statistics comparing a 512-megabyte single processor CPU versus a one-gigabyte dual processor CPU, using Encase (Version 4). In tasks involving keyword searches, file hashes, and file carving, there is a five- to six-fold increase in speed! In addition, dual processor computers can truly multitask, running various processes in the background while displaying recovered data to the examiners in the foreground.

### **Autoloader Technology**

Another means to increase examiner productivity is to improve data archiving. Many organizations still use CD’s to archive hard drive images. However, archiving a 60 or 100 gigabyte hard drive to dozens of CD’s is a very labor intensive process. In such cases, the low cost of the CD’s is offset by the examiner labor it takes to split and record the hard drive image. Alternatively, the use of tape drives with autoloader features can make the entire archive process a background exercise if a sufficient amount of tapes are placed into the autoloader queue. Typically, the archive process

with CD technology (or tape technology without an autoloader) can consume an examiner’s computer for up to two days if the hard drive is large. However, with an autoloader, the archive process can usually run overnight or over a weekend without any substantive loss in examiner work time.

Autoloader technology is a little more expensive than better software platforms, additional memory, or dual processing. A typical DDS-4 tape drive with an autoloader feature sells for \$2500. However (as was noted above), when examiner labor rates are \$65-\$100 per hour, the additional expenditures for autoloader technology is quickly recovered.

### **SAN Technology**

One other interesting possibility involves the use of Storage Access Network (SAN) or Network Access Storage (NAS) technologies for processing multiple exhibits simultaneously. The technology involves the use of high performance network client computers or server technology to access a number of high data storage capacity hard drives very quickly. The mounting of multiple drives on a high performance computer system can simplify evidence work copy handling, and allow multiple drives to be searched simultaneously (as opposed to sequential searches, which take much more time). The use of the SAN or NAS technologies may be beneficial for organizations that typically have a large number of exhibits per case or enormous amounts of

data (terabytes) to search.

### **The Big Picture**

The decision by digital laboratory management to implement technology upgrades will pay quick dividends in terms of examiner productivity. Technology upgrades are relatively cheap and the payoffs can be substantial. Although technical upgrades are not a long-term solution to staffing shortages, DEA’s experience has shown that such investments are a very worthwhile and viable interim strategy.

Questions or comments?  
e-mail: [mphelan@erols.com](mailto:mphelan@erols.com)

# Microgram

## *Bulletin*

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**VOL. XXXVI, NO. 9**

**SEPTEMBER 2003**

**- INTELLIGENCE ALERT -**

**HEROIN IN BOOK BINDINGS IN FORT LAUDERDALE, FLORIDA**



**Photo 1**

The Broward Sheriff's Office Crime Laboratory (Ft. Lauderdale, Florida) recently received two books entitled: "Mas Platon y Menos Prozac" (roughly: "More Support and Less Prozac").

Both books contained a rectangular chunk of compressed, brown colored powder (wrapped in clear plastic) in a cut-out area of their bindings, suspected heroin (see Photo 1, previous page). The books were mailed to a Fort Lauderdale address by an express delivery service, and were intercepted (and a controlled delivery performed) by the Broward Sheriff's Office. Analysis of the powder (total net mass 99.0 grams) by crystal testing and GC/MS confirmed heroin (quantitation not performed, but the analysis suggested high purity). This is the first time this smuggling technique has been encountered by the Crime Laboratory.

\* \* \* \* \*

### **- INTELLIGENCE ALERT -**

#### **OPIUM-"STARCHED" BLANKET IN FITCHBURG, MASSACHUSETTS**

The Massachusetts State Police Crime Laboratory (Sudbury, Massachusetts) recently received an unusual two-part submission consisting of a black blanket/sheet, measuring approximately 32 inches by 70 inches, folded in half and inserted into a multi-print fabric sleeve, measuring approximately 28 inches by 40-1/2 inches (see Photos 2 and 3), suspected to be opium-laced. The exhibit (total net mass 834 grams) was originally seized by the U.S. Customs Service in Hawaii, and was subsequently control delivered to a residence in Fitchburg (central Massachusetts), then submitted to the Crime Laboratory by a local Drug Task Force. Analysis of extracts of the black blanket/sheet by GC and GC/MS indicated the presence of opium, confirming codeine, morphine, thebaine, papaverine, and noscapine (quantitation not performed). This was the Crime Laboratory's first encounter with an opium-laced blanket/sheet.



**Photo 2**



**Photo 3**

[Editor's Notes: According to the analyst, the controlled delivery was made to an elderly individual of southeast Asian descent. Smuggling of opium "starched" into cloth has been previously reported in *Microgram* in the mid-1980's (twice), but is not a commonly used technique - probably because opium has a fairly pronounced odor which is difficult to either disguise or conceal.]

**- INTELLIGENCE ALERT -**

**CALIFORNIA OPIUM FIELD DISCOVERED IN NATIONAL FOREST**

**From the *Forensic Drug Abuse Advisor* 2003;15(7):53**

[Editor's Preface: This Alert is provided in followup to the NDIC Brief that was reprinted in the August 2003 issue of *Microgram Bulletin*. Unclassified; Reprinted With Permission.]

Everyone knows about the Barbary Coast opium dens that operated in San Francisco during the 1890s, but it came as a great surprise to officials when, in mid-June, when a hiker stumbled upon a nearly two acre field of 1-to-3 foot tall lavender opium poppies. When the hiker returned with a forest ranger, they discovered 40,000 opium poppies growing in the Sierra National Forest, 35 miles northeast of Fresno. They also discovered three men in camouflage suits who were scoring the poppies in preparation for harvesting the opium latex. They ran away and were not caught. U.S. Forest Service officials said this is largest crop of the narcotic- producing plants they have ever found in California. Agents from the U.S. Drug Enforcement Administration say that people in the heroin and opium trade may be following in the footsteps of marijuana growers, who in the past 10 years have set up multimillion-dollar plantations in remote areas of national parks and forests across the state. Those farms, some believed to be financed by Mexican drug cartels, often are guarded by armed men, posing a danger to hikers and hunters who wander off designated trails.

According to Forestry service spokesman, there was no sign that anyone was living on the poppy plantation (someone usually sticks around to keep an eye on marijuana plantations). The poppies had been planted on a south-facing slope that had been cleared of vegetation by a fire in 2001. All the plants have been cleared and are being analyzed in a DEA laboratory.

The 40,000 confiscated plants could have produced approximately 40 pounds of raw opium or 4 pounds of heroin. According to the DEA spokesman, a pound of heroin sells wholesale for between \$16,000 and \$18,000 [See Editor's Notes, next page]. He also indicated that at retail, [heroin] goes for between \$50 to \$100 a gram. Taylor said the DEA doesn't know what opium sells for today, but in 1999 it could go for as much as \$15,000 a pound. In the United States it has been illegal to grow opium poppies since 1932.

A DEA spokesman said agents were aware of opium being imported into Fresno and Sacramento from Southeast Asia, and that there had also been some reports of some individuals in the Central Valley smoking opium in pipes or inhale the fumes from a tin foil. The practice, long known in China as "chasing the dragon" appears to have finally arrived in the United States.

California is not the only place where opium production is on the rise. According to a United Nations survey, 2003 saw one of the best Afghan opium harvests ever. Production has been rising ever since the ouster of the Taliban. This year Afghanistan is again expected to be the world's No. 1 producer of opium with a harvest of more than 4,000 tons, enough to produce 400 tons of pure heroin.

[Editor's Notes: The quoted prices for heroin in the above Intelligence Brief are a little low. Current west-coast prices for black tar heroin are running between \$15,000 - \$65,000 per kilo (\$6,800 - \$29,500 per pound), whereas east coast prices for "white" heroin are running \$60,000 - \$85,000 per kilo (\$27,300 - \$38,600 per pound).]

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### **- INTELLIGENCE ALERT -**

#### **COCAINE INSIDE A LARGE CANDLE IN NORFOLK, VIRGINIA**

The DEA Mid-Atlantic Laboratory (Largo, Maryland) recently received a submission of a large scented, rectangular candle in a metal tin, suspected to contain concealed cocaine (see Photo 4). The candle (ca. 12 x 6 x 3.5 inches) had three wicks and a very strong mulberry-like scent. It was seized by the Norfolk Police at a local FedEx distribution center (point of origin not reported). The cocaine was in the shape of a brick and was wrapped in several layers of plastic and rubber, which was in turn embedded within the wax. Recovery required cutting the metal container off the candle, then chiseling the wax off the package.



**Photo 5**

Analysis by GC/FID and FTIR-ATR confirmed 81 percent cocaine hydrochloride (total net mass 974.9 grams). Although the Mid-Atlantic Laboratory has previously received cocaine in candles, this was the first encounter with a large candle in a metal tin.

\* \* \* \* \*

### **- INTELLIGENCE BRIEF -**

#### **40 YEAR OLD PSILOCYBIN TABLETS IN MENDOCINO COUNTY, CALIFORNIA**

The State of California, Bureau of Forensic Services Laboratory (Eureka, California) recently received an interesting polydrug submission from Mendocino County (about 110 miles north of San Francisco), including cocaine powder (1.08 grams), dimethyltryptamine (DMT, compressed powder, 0.07 grams), an MDA capsule (0.09 grams), an MDMA capsule (0.23 grams), methamphetamine (0.49 grams), methaqualone tablets (two standard Lemmon 714 logo tablets), psilocybin mushrooms (36.01 grams), and psilocybin tablets (six, single scored, in very fragile condition). The exhibits were seized by the Mendocino County Sheriff's Office (circumstances not reported); analysis was done with a variety of color tests and GC/MS. The submission had a number of unusual aspects - the DMT powder was highly compressed, had a strong mothball



odor (not further identified), and had the appearance of amber (see Photo 5), the MDA and MDMA were both present in clear gelatin capsules, methaqualone tablets hadn't been seen by the laboratory in years, and the psilocybin tablets were in what appeared to be the original packaging (glass bottle with metal screw on lid, labelled: "Sandoz Pharmaceuticals, 50 tablets, Psilocybin, each tablet contains 10 mg, Research Material") (see Photo 6). According to the Drug Identification Bible, 2002, these tablets were manufactured between 1958 and 1965. GC/MS analysis of the psilocybin tablets showed minute traces of psilocin, with the major peaks being the tablet binders. None of the exhibits were quantitated. This was the laboratory's first ever encounter with psilocybin tablets.

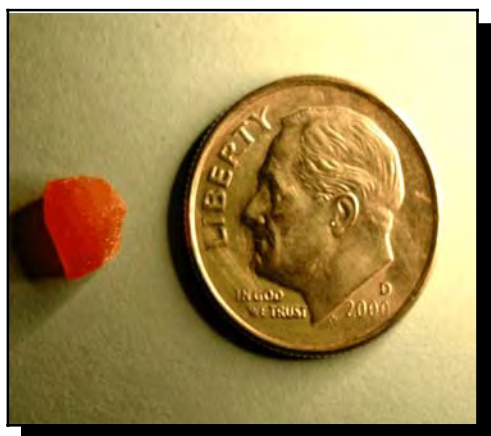


Photo 5

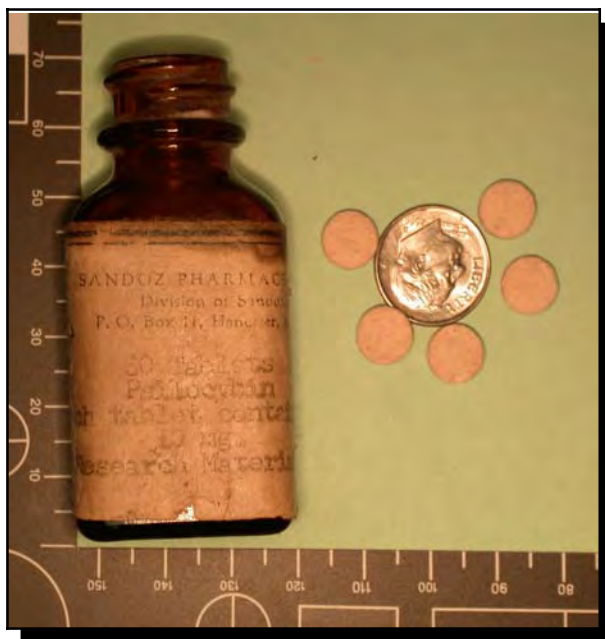


Photo 6

\* \* \* \* \*

#### - INTELLIGENCE BRIEF -

#### MIXED MDMA / l-METHAMPHETAMINE / KETAMINE TABLETS WITH THE MERCEDES-BENZ LOGO IN SAN JOSE, CALIFORNIA

The DEA Western Laboratory (San Francisco, California) recently received 985 light pink tablets imprinted with the Mercedes-Benz logo, suspected Ecstasy (see Photo 7). The exhibit was acquired in San Jose via an undercover purchase by the DEA San Jose Regional Office. Each tablet was approximately 8 millimeters in diameter and weighed 440 milligrams. Analysis by GC/MS and GC/IRD, however, indicated not only MDMA (43 milligrams/tablet, calculated as the hydrochloride salt) but also methamphetamine (11 milligrams/tablet, calculated as the hydrochloride salt) and ketamine (not quantitated, salt form not determined). Unusually, derivatization with TPC determined that the



Photo 7



methamphetamine was the *l*- isomer. This was the first submission to the Western Laboratory of this type of tablet; however, a second submission of similar tablets has since been received.

\* \* \* \* \*

**- INTELLIGENCE BRIEF -**

**TFMPP AND BZP IN YPSILANTI, MICHIGAN**

The DEA North Central Laboratory (Chicago, Illinois) recently received a submission of fine, white powders in capsules and plastic bags, composition unknown (photos not taken). The exhibits were acquired in Ypsilanti by the DEA Detroit Field Division. The first exhibit (50 capsules) was purchased undercover, and was being sold as “Molly”. The remaining five exhibits were seized from the defendant’s residence. Two exhibits consisted of clear, oblong, capsules (approximately 21 millimeters in length), each filled with varying amounts of the powder. The remaining four exhibits consisted of bags of the powder. Analyses by color tests, GC/MS, FT-IR, NMR, and GC/FID indicated either 1-(3-trifluoromethylphenyl)piperazine (TFMPP, calculated as the hydrochloride salt), or a mixture of TFMPP and 1-benzylpiperazine (BZP, calculated as the hydrochloride salt). The capsules contained only TFMPP, at 178 milligrams/capsule (14.1 grams net in 50 capsules) and 106 milligrams/capsule (11.9 grams net in 57 capsules), respectively. Two of the bags also contained only 91 percent TFMPP (500.4 grams and 124.0 grams, respectively). The remaining two bags contained, respectively, 85 percent TFMPP and 7.3 percent BZP (20.7 grams), and 30 percent TFMPP and 57 percent BZP (15.5 grams). The defendant claimed to have purchased both compounds over the Internet before they were controlled. TFMPP and BZP have been identified numerous times at the North Central Laboratory.

\* \* \* \* \*

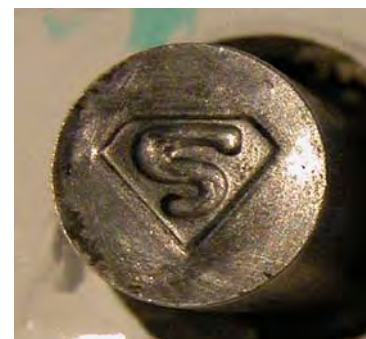
**- INTELLIGENCE BRIEF -**

**LARGE MDMA SYNTHESIS LABORATORY AND TABLETTING OPERATION  
SEIZED IN SCARBOROUGH, ONTARIO, CANADA**

The DEA Special Testing and Research Laboratory’s Source Determination Program (Dulles, Virginia) recently received a small selection of tablets and digital photographs of a large number of tablet punches from an operational Ecstasy tableting operation in Scarborough, Ontario, Canada. The laboratory was seized by the Royal Canadian Mounted Police (RCMP) in cooperation with several other Canadian police agencies. A separate synthesis laboratory was also seized nearby (details on the synthesis route not available). In all, 147 punches, about 200,000 tablets, and sufficient MDMA powder to manufacture an additional 100,000 tablets were seized (total net masses of tablets and powder not reported). Analysis of the forwarded tablets indicated various mixtures of caffeine, methamphetamine, amphetamine, MDMA, GHB, ketamine, and acetaminophen. Photographs of twenty of the more interesting tablet punches are shown on the next two pages. This is believed to be the largest and certainly most varied MDMA tableting operation ever seized in North America.

[Additional comments from the Source Determination Program: Although sometimes overlooked by personnel seizing clandestine laboratory sites, tablet punches can be extremely useful evidence. Detailed toolmark analysis on both tablets and seized tablet punches can potentially link them to many other cases featuring the same tablets made by the same punches. This information can then be used in court to show the duration and extent of a clandestine operation, that is, approximately how long the laboratory was in operation, the kinds of drugs used in various batches of the tablets (and how they changed over time), and the approximate geographical distribution of the tablets. This information can assist in the successful prosecution of conspiracy cases.]





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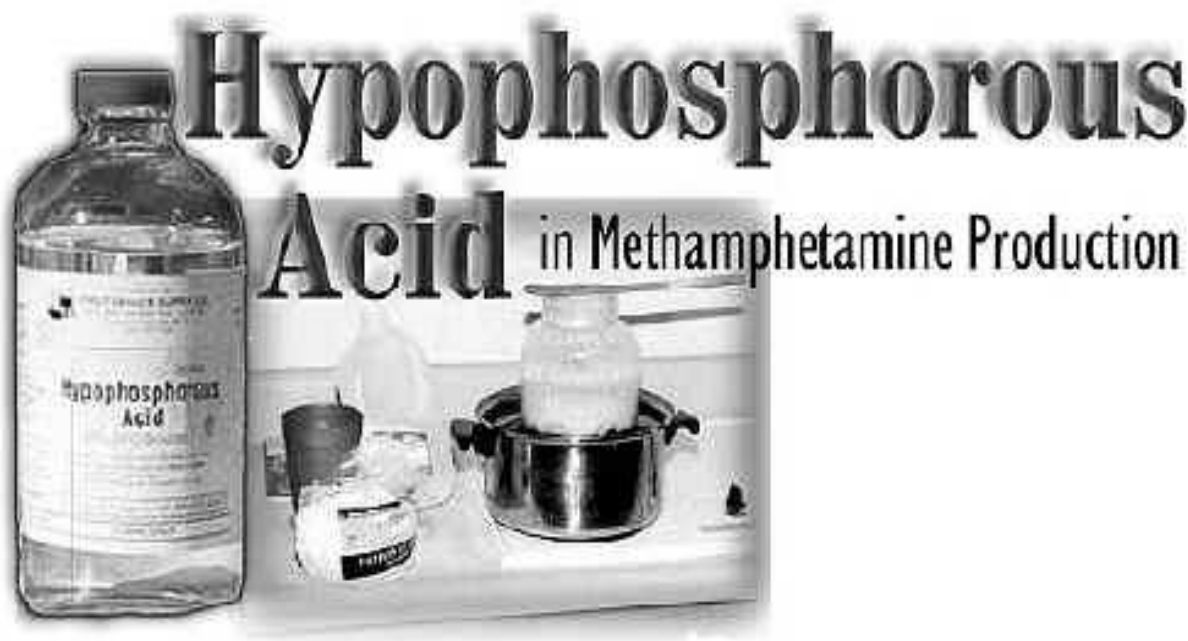
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## Selected Intelligence Brief



**National Drug Intelligence Center  
319 Washington Street, 5th Floor  
Johnstown, PA 15901**

**814/532-4601**

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### **Overview**

Hypophosphorous acid, which is used legally for a variety of commercial purposes, is a chemical that increasingly is substituted for red phosphorus in the methamphetamine production process. The federal government regulates the sale of hypophosphorous acid through registration, record keeping, reporting, and import/export requirements regardless of the quantity being handled or distributed. Although hypophosphorous acid is a List I chemical under the Controlled Substances Act, methamphetamine producers typically purchase the chemical via the Internet or from associates who also are engaged in methamphetamine production. The use of hypophosphorous acid in methamphetamine production is an extremely dangerous practice because of the deadly gases that can be generated as well as the risk of fire or explosion.

### **Characteristics and Availability**

Hypophosphorous acid ( $\text{H}_3\text{PO}_2$ , also called phosphinic acid) is a strong acid that typically is prepared as a solution of colorless, oily liquid in strengths of 50 percent, 30 to 32 percent, and 10 percent. It also is prepared in the form of salts (referred to as hypophosphite salts), particularly ammonium hypophosphite,

calcium hypophosphite, iron (ferric) hypophosphite, magnesium hypophosphite, manganese hypophosphite, potassium hypophosphite, and sodium hypophosphite.

Over 100 chemical firms located throughout the world produce hypophosphorous acid. The People's Republic of China and India have the largest numbers of hypophosphorous acid producers, although there are a few producers in the United States. There are a wide variety of uses for hypophosphorous acid and its salts in commercial industry; however, the chemicals have no legitimate household or retail uses. The legitimate commercial and laboratory fields that use hypophosphorous acid and its salts include the following:

- Chemical plating
- Food preparation
- Water treatment
- Polymers (as a bleaching agent, color stabilizer, or catalyst)
- Education and research in analytical chemistry

Chemical suppliers typically distribute hypophosphorous acid in large quantities, for example, in drums containing 275 pounds of the diluted solution. Hypophosphorous acid also is distributed in smaller quantities. One-half liter of 50 percent concentrate hypophosphorous acid solution can be obtained from chemical suppliers for as little as \$14. Methamphetamine laboratory operators typically obtain small quantities of the chemical from other laboratory operators who purchase large quantities of the chemical and repackage it for further distribution. According to law enforcement sources, these individuals sell hypophosphorous acid for as much as \$1,000 per half-liter. Methamphetamine laboratory operators also purchase hypophosphorous acid via the Internet. (See expansion below.)

### **Hypophosphorous Acid and the Internet**

The Internet is a source of a great deal of information regarding hypophosphorous acid. Popular Internet sites that disseminate information about illicit drugs contain information about the chemical, including numerous recipes for home production of methamphetamine using hypophosphorous acid. There also are recipes for synthesizing hypophosphorous acid from available chemicals. Hypophosphorous acid solutions and salts have been sold to the general public via the Internet. The Drug Enforcement Administration (DEA) has strong concerns regarding the sale of chemicals on the Internet and has requested that any sites (such as auction sites) that allow the sale of regulated chemicals on their domains require proof of DEA registration from their clients.

### **Hypophosphorous Acid Used in Methamphetamine Production**

Hypophosphorous acid is used in the ephedrine/pseudoephedrine reduction method of methamphetamine production. (See NDIC Information Brief Methamphetamine Production Methods, A Guide for First Responders, April 2003.) It is used in the methamphetamine production process to produce hydriodic acid, an important reagent (it reacts with the ephedrine/pseudoephedrine but does not become part of the finished product). The regulation of hydriodic acid by DEA in 1993 rendered it virtually unavailable in the United States. However, methamphetamine laboratory operators discovered methods to produce

hydriodic acid using a combination of iodine in water with red phosphorus. Laboratory operators found that red phosphorus could be obtained easily, either from commercial supply companies or by scraping the striker pads from matchbooks or matchboxes. Methamphetamine producers soon discovered that hypophosphorous acid also could be used in combination with iodine and water to produce hydriodic acid.

The practice of using hypophosphorous acid in methamphetamine production is believed to have begun in the United States in the late 1990s when a methamphetamine producer in Colorado obtained the recipe from Australia, where the hypophosphorous acid method is prevalent. This man was known as a serial cook who had a long history of methamphetamine production. Over several years he trained other laboratory operators in Colorado to produce methamphetamine using hypophosphorous acid. As his techniques were passed on to others, the number of methamphetamine laboratories in Colorado using hypophosphorous acid continued to increase, and the technique was passed on to numerous methamphetamine producers in other states.

According to the El Paso Intelligence Center (EPIC) National Clandestine Laboratory Seizure System, from 2000 through 2002 the number of seized methamphetamine laboratories in the United States in which hypophosphorous acid was found increased overall. (See Table 1.)

**Table 1. Methamphetamine Laboratories With Hypophosphorous Acid Present, 2000-2003**

<b>Year</b>	<b>Total</b>	<b>Top 3 States</b>
2000	89	California, Colorado, Nevada
2001	107	Colorado, Mississippi, Oklahoma
2002	102	Colorado, Missouri, Oklahoma
2003 (as of 3/31/02)	36	Colorado, Kansas, Oklahoma

**Source: El Paso Intelligence Center National Clandestine Laboratory Seizure System.**

Hypophosphorous acid found at methamphetamine laboratories is packaged in a variety of ways. The chemical has been found in 1-gallon bottles of solution or in 1-pound jars of salts. Some hypophosphorous acid containers are labeled as "plating solution." Pint-sized brown glass bottles wrapped in red electrical tape also have been found to contain hypophosphorous acid; they have been discovered primarily in Colorado.

The vast majority of hypophosphorous acid found at laboratory sites has been recovered from small toxic laboratories (STLs), those which yield gram to ounce quantities per production cycle. Hypophosphorous acid has not been reported at large-scale laboratories operated by Mexican criminal groups in the United States.

## **Hazards**

The iodine/hypophosphorous acid method is more hazardous than the iodine/red phosphorus method although the reaction using hypophosphorous acid is faster and gives slightly higher yields.



When hypophosphorous acid is used, the chemicals must be mixed together slowly in a particular order to prevent them from reacting violently. The combination of hypophosphorous acid with the other chemicals and with certain metals can produce deadly phosphine gas during the initial mixing step and can continue to produce phosphine gas for several days after production has been completed. The iodine/hypophosphorous acid mixture has a tendency to decompose quickly when overheated or if heated for long periods of time, becoming cloudy or "milky-white" just prior to giving off a cloud of phosphine gas that can ignite spontaneously. Hypophosphorous acid solutions may become unstable if evaporation results in concentrations above 50 percent.

[Note: Law enforcement or emergency personnel who encounter suspected containers of hypophosphorous acid should use extreme care during handling because laboratory operators often attempt to obtain a more concentrated acid by allowing water to evaporate from the mixture.]

Because hypophosphorous acid often is used at small methamphetamine laboratories operated by inexperienced or careless individuals, the potential hazards of using this method are even greater. The risk of fire and explosion is higher in these laboratories, where professional laboratory equipment typically is not used to contain the phosphine gas and where safe handling precautions are not employed. In addition, these laboratories often are located in homes where children are present and may come into contact with hypophosphorous acid. A child can easily mistake hypophosphorous acid for any other clear liquid, particularly if it is stored in household containers or drinking glasses. Skin, eye, or inhalation exposure can be extremely harmful or fatal.

### **Safety Precautions**

- Always wear a self-contained breathing apparatus as well as protective clothing when entering areas where hypophosphorous acid may be present.
- When in contact with metals or in a high-temperature environment, hypophosphorous acid can break down and liberate phosphine and flammable hydrogen gas. Do not allow the use of open flames, open lights, matches, or smoking in or around laboratories or dumpsites where hypophosphorous acid is handled.
- In case of fire, use a self-contained positive pressure breathing apparatus and full protective equipment. Use water spray, fog, foam, dry chemicals, or other reagents as may be appropriate for materials in the surrounding fire.
- Water may be used to cool the containers of hypophosphorous acid; however, use extreme care to avoid allowing water to enter the container.
- In case of spills, neutralize the spilled chemical with alkaline material (soda ash, lime), then absorb it with an inert material such as vermiculite, dry sand, or earth and place in a chemical waste container. Do not use combustible materials such as sawdust.

### **Legislation and Control**

In the United States hypophosphorous acid is one of 38 chemicals (or groups of chemicals) controlled under law by DEA. On October 17, 2001, hypophosphorous acid and its salts, along with red and white phosphorus, were officially added as List I chemicals under section 1310 of the Code of Federal Regulations. List I chemicals are defined as chemicals that are used in the manufacture of a controlled substance in violation of the Controlled Substances Act (CSA) and are important to the manufacture of a controlled substance. Under the law, suppliers are required to maintain records and report receipts, sales,

imports, and exports of these chemicals to DEA. Hypophosphorous acid, red phosphorus, and white phosphorus, as well as ephedrine, are unique in that suppliers are required to report all transactions of these chemicals, regardless of the amount. By contrast, the other 34 listed chemicals are only reportable after a supplier's transactions for a chemical reach an established weight or volume threshold in a calendar month.

In addition to reporting all transactions involving the chemical, suppliers are expected to "know their customers" in order to prevent the diversion of these substances to methamphetamine laboratories, as it is illegal to import, export, purchase, or sell hypophosphorous acid or any other listed chemical in the United States if it is used or intended to be used in the production of a controlled substance. Chemical suppliers are held liable for selling listed chemicals if they know or suspect that the chemical will be used for illicit purposes.

## Outlook

The use of hypophosphorous acid in the production of methamphetamine is likely to increase, particularly in the Midwest and Southwest regions of the United States where methamphetamine production is prevalent. Injuries, property damage, and deaths also will increase as a growing number of inexperienced methamphetamine producers experiment with hypophosphorous acid.

[Editor's Note: The above referenced NDIC Intelligence Brief entitled: "Methamphetamine Production Methods, A Guide for First Responders" (April 2003) is a law enforcement restricted publication.]

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## SELECTED REFERENCES

[Note: Selected references are a compilation of recent publications of presumed interest to forensic chemists. Unless otherwise stated, all listed citations are published in English. If available, the email address for the primary author is provided as the contact information. Listed mailing address information (which is sometimes cryptic or incomplete) exactly duplicates that provided by the abstracting services.]

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2. Schneider RC, Kovar K-A. **Analysis of ecstasy tablets: Comparison of reflectance and transmittance near infrared spectroscopy.** Forensic Science International 2003;134(2-3):187. [Editor's Notes: Presents analyses of mixed composition tablets by the title techniques; transmittance mode was found to be better than reflectance mode. Contact: Pharmaceutical Institute, Department of Pharmaceutical Analysis, University of Tübingen, Auf der Morgenstelle 8, Tübingen 72076, Germany.]
3. Kochana J, Wilamowski J, Parczewski A, Surma M. **Synthesis of standards of the most important markers of Leuckart p-methoxymethamphetamine (PMMA). Examination of the influence of experimental conditions and a drug diluent on SPE/TLC profiling.** Forensic Science International 2003;134(2-3):207. [Editor's Notes: Presents syntheses of characteristic markers for Leuckart-synthesized PMMA, and their use in SPE/TLC analyses. Contact: Faculty

of Chemistry, Department of Analytical Chemistry, Jagiellonian University, Ingardena 3, Krakow 30-060, Pol.]

4. Kochana J, Wilamowski J, Parczewski A. **Profiling of impurities in p-methoxy-methamphetamine (PMMA) by means of SPE/TLC method. Examination of the influence of experimental conditions according to 2<sup>4</sup> factorial.** Forensic Science International 2003;134(2-3):214. [Editor's Notes: Presents a profiling study of Leuckart-synthesized PMMA, using SPE/TLC. Contact: See Abstract #3 above.]
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#### Additional References of Possible Interest:

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5. Bazylak G, Nagels LJ, Monge ME. **Macrocycle versus podant-type neutral ionophore in potentiometric detection of mucolytic agents following separation by various HPLC modes.** Chromatographia 2003;57(11-12):757. [Editor's Notes: Presents a methodology for detection of clenbuterol (and other select lipophilic drugs) in oral formulations. Contact: G. Bazylak, Ludwig Rydygier Med Univ, Fac Pharm, Dept Drug Chem, Jagiellonska 13, PL-85067 Bydgoszcz, Poland.]

\* \* \* \* \*

## THE DEA FY - 2003 AND FY - 2004 STATE AND LOCAL FORENSIC CHEMISTS SEMINAR SCHEDULE

The remainder of the FY - 2003 schedule for the DEA's State and Local Forensic Chemists Seminar is as follows:

September 15 – 19, 2003

The FY - 2004 schedule is as follows:

December 8 - 12, 2003  
February 9 - 13, 2004  
April 19 - 23, 2004  
June 14 - 18, 2004  
September 20 - 24, 2004

Note that the school is open only to forensic chemists working for law enforcement agencies, and is intended for chemists who have completed their agency's internal training program and have also been working on the bench for at least one year. There is no tuition charge for this course. The course is held

at the AmeriSuites Hotel in Sterling, Virginia (near the Washington/Dulles International Airport). For additional information, eligibility requirements, or to enroll, call 703 668-3337.

\* \* \* \* \*

## EMPLOYMENT OPPORTUNITIES

### 1. Indian River Crime Laboratory

(Third and Final Posting)

**Position:** Forensic Chemist

**Location:** Fort Pierce, Florida

**Salary:** \$45,000 – \$60,000, Depending on Experience

**Application Deadline:** Open Until Filled

**Duties:** Responsibilities include the analysis of controlled substances; interpretation of laboratory analyses and results; preparation of written reports; and the ability to testify as an expert witness.

**General Requirements:** The applicant must be skilled in using gas chromatography, mass spectroscopy, ultraviolet and infrared spectrophotometry and other drug analysis equipment and methodologies. A familiarity with the technical and safety requirements of ASCLD-LAB, and demonstrated proficiency testing in controlled substance analysis are required. A Master's degree in chemistry or forensic science (with chemistry undergraduate degree) and two years of forensic laboratory experience are preferred. Experience in head-space BAC analysis is desirable. An extensive background investigation is required, and laboratory personnel are subject to random drug testing. EEO.

**Application Procedure:** Applications may be obtained on-line at [www.stluciesheriff.com](http://www.stluciesheriff.com) or by contacting:

Saint Lucie County Sheriff's Office  
Human Resources Department  
4700 W. Midway Road  
Fort Pierce, Florida 34981-4825  
Phone: (772) 462-3206  
Fax: (772) 462-3218

For information about the position, contact:

Daniel C. Nippes  
Chief Criminalist  
Indian River Crime Laboratory  
2502 S. 35th Street  
Fort Pierce, Florida 34981  
[dnippes@ircc.edu](mailto:dnippes@ircc.edu)  
Phone: (772) 462-4765

\* \* \* \* \*

### 2. Houston Police Department

(Second Posting)

**Position:** Crime Laboratory Director

**Location:** City of Houston, Texas

**Salary Range:** \$92,066 - \$100,000 Annually, Dependant on Qualifications

**Application Deadline:** Open Until Filled

**Duties:** Manages the daily operations of the Crime Laboratory, including DNA Analysis, Serology, Toxicology, Drug Identification, Trace evidence analysis, Firearms/Toolmark Examination and evidence registration; will serve as Crime Laboratory Director; hires, supervises and evaluates staff of fifty (50) persons; prepares, administers and monitors division budget; ensures compliance with all federal, state and local laws and regulations regarding physical evidence; oversees development and implementation of standard forensic testing practices and procedures for all sections of Crime Laboratory in accordance with standards set forth by ASCLD-LAB or other appropriate accrediting entity to achieve and maintain laboratory accreditation; plans and implements programs to ensure quality control of laboratory including the generation and storage of laboratory case reports and records; reviews reports and documents concerning evidence analysis and findings; plans directs and oversees the continuous training for all aspects of forensic laboratory services to keep Criminalists up-to-date with all methods of

forensic work; works with Investigative Division supervisors to develop protocols for prioritizing laboratory services usage; coordinates division operations with outside agencies and other government agencies; provides physical evidence information to law enforcement agencies, attorneys, judges, the District Attorney's Office and other scientific professionals; reports to an Assistant Chief; performs related duties as required.

**Qualifications:** Educational: Graduation from an accredited college or university with an Advanced Degree and major course of study in Criminalistics, Chemistry or any natural or physical science - or - graduation from an accredited four-year college or university with a major course of study other than one of the described sciences plus fifteen (15) or more years of increasingly complex forensic work experience in a crime laboratory. Experience: Seven (7) years progressively responsible Crime Laboratory experience including two (2) years supervisory experience in an accredited laboratory; or an equivalent combination of education and experience. License: Valid Texas Driver's License and compliance with city's policy on driving (AP 2-2).

**Application Procedures:** Original applications only are accepted and must be received by the Human Resources Department, at 611 Walker, First Floor, Houston, Texas, 77002.

\* \* \* \* \*

### **3. Hamilton County Coroner's Crime Laboratory**

(Second Posting)

**Position:** Drug Analyst

**Location:** Cincinnati, Ohio

**Salary Range:** \$33,467.00 (Note: Hamilton County has an excellent retirement and benefits program.)

**Application Deadline:** Open Until Filled

**Duties:** Primary responsibility is to analyze and identify controlled substances using GC-MS, FTIR, and other analytical techniques. Analyst is required to present expert testimony in court. Staff members must comply with safety, quality control, technical and administrative procedures required by accrediting agencies. Analysts also routinely instruct law enforcement officers and other criminal justice professionals on matters relating to forensic science.

**Qualifications:** A BS/BA degree in forensic science or related natural science from an accredited college. Applicants must have completed an internship in a forensic laboratory. A strong background in mass spectrometry, pharmaceutical analysis, or analytical chemistry is desirable. Applicants must possess, or be able to obtain, a valid drivers license.

**Application Procedures:** Submit resume with cover letter to the contact listed below. Individuals selected for interviews are responsible for their own travel expenses.

William L. Dean  
Chief of Forensic Sciences  
Hamilton County Coroner's Crime Laboratory  
3159 Eden Ave.  
Cincinnati, Ohio 45219

Phone: 513-946-8755

E-mail: [bill.dean@hamilton-co.org](mailto:bill.dean@hamilton-co.org)

Fax: 513-946-8772

Website: [www.hamilton-co.org/coroner](http://www.hamilton-co.org/coroner)

\* \* \* \* \*

### **4. Broward County Sheriff's Office (BSO)**

(First Posting)

**Position:** Crime Laboratory Manager

**Location:** Fort Lauderdale, Florida

**Salary Range:** To Be Determined.

**Application Deadline:** Open Until Filled

**Duties:** This position directs, administers and manages all forensic services functions for the BSO. Critical functions under charge include the Crime Laboratory, Automated Fingerprint Identification System (AFIS), and Latent Identification. Employees in this classification maintain responsibility for the direction, and management of personnel engaged in latent and ten-print identification, audio/video enhancements, quality control/quality assurance, DNA analysis, firearms and tool mark identification, forensic chemistry, questioned documents examination, and trace evidence analysis.

**Qualifications:** A Master's degree in chemistry, biology, or another physical science is required; a Ph.D. is preferred. The



position also requires ten years experience that includes advanced forensic chemistry, biology or criminalistics preferably in a large national, state or regional laboratory. Thorough knowledge of DNA processing and American Society of Crime Laboratory Directors (ASCLD) certification required; certification by the American Board of Criminalistics (ABC) preferred. Experience in a managerial capacity with responsibility for administrative aspects of the work strongly desired.

**Application Procedures:** You may view a detailed job description, download an application or apply on-line at: [www.sheriff.org](http://www.sheriff.org). A completed application and accompanying resume will also be accepted by mail: Broward Sheriff's Office, Human Resources Bureau, 2601 W. Broward Blvd., Fort Lauderdale, FL 33312.

EOE M/F/D/V DFWP

\* \* \* \* \*

#### 5. Ohio University

(First Posting)

**Position:** Assistant/Associate Professor of Forensic Chemistry

**Location:** Athens, Ohio

**Salary:** [Not Listed]

**Application Deadline:** Open Until Filled

**Duties:** The Department of Chemistry and Biochemistry invites applications for a tenure-track position as an assistant/associate professor of forensic chemistry. We seek a chemist with postdoctoral or related experience and a research interest in forensic chemistry or related fields (toxicology, DNA typing, homeland security, etc.)

**General Requirements:** The successful applicant will be expected to have a Ph.D. in chemistry or a related field, and to establish a vigorous research program that will attract external funding. Candidates should be prepared to teach general chemistry as well as courses in their area of specialization at both the undergraduate and graduate (M.S. and Ph. D.) levels.

**Application Procedure:** Submit a curriculum vita, a research plan, a statement of teaching philosophy, and arrange to have at least three letters of recommendation sent to: Chair, Search Committee, Department of Chemistry and Biochemistry, Clippinger Laboratories, Ohio University, Athens, OH 45701-2979. Review of applications will begin on September 22, and will continue until the position is filled. Further information on the College of Arts and Sciences can be viewed at <http://www.cas.ohiou.edu> and on the position and the department at <http://www.chem.ohiou.edu> Minority and female applicants are especially encouraged to apply.

Ohio University is an Affirmative Action/Equal Opportunity employer.

\* \* \* \* \*

## SCIENTIFIC MEETINGS

### 1. Title: American Academy of Forensic Sciences - 56th Annual Meeting

(Second Posting)

**Sponsoring Organization:** American Academy of Forensic Sciences

**Inclusive Dates:** February 16 - 21, 2004

**Location:** Dallas, TX

**Contact Information:** [See website]

**Website:** [www.aafs.org](http://www.aafs.org)

\* \* \* \* \*

### 2. Title: 44th Annual International Drug Conference

(Second Posting)

**Sponsoring Organization:** International Narcotic Enforcement Officers Association

**Inclusive Dates:** October 19 - 25, 2003

**Location:** Fort Lauderdale, FL (Wyndham Bonaventure Resort and Spa)

**Contact Information:** [None Listed]

**Website:** [None Listed]

\* \* \* \* \*

# Computer Corner

## Examiner Candidate Interview Strategies

# #174

by Michael J.  
Phelan

DEA Digital Evidence  
Laboratory

The hiring of a new examiner is one of the most important managerial tasks in a digital evidence laboratory – and is also considerably more challenging versus hiring in most other technical disciplines. The absence of formal computer forensics degrees from academia, the plethora of IT “certifications” from a wide variety of private industry sources (good, bad, and indifferent), and the lack of standardization of IT job titles, all significantly complicate the evaluation of perspective employees.

### Advertisement

The first step should consist of an accurate and highly specific advertisement of the position. Key words such as computer forensics, digital evidence, or computer examination should be prominent. A detailed description of the scope of the work (stand-alone computers, networks, or electronic digital devices), required expertise (entry level, mid-level, or senior), and software tool familiarity should all be provided. Exact requirements eliminate inquiries and applications from (most) unqualified applicants.

### Resume Review

The second step - review of resumes - is necessary to identify

those candidates that merit further consideration, such as individuals with a strong IT background or previous experience in computer forensics.

### The Interview Process

The third and most important step is the interview. Due to the aforementioned variability in qualifications, even the best looking candidates may actually just be “paper tigers”.

Experience at DEA has shown that the resume review process needs to be supplemented with an extensive and systematic interview to identify the actual breadth and depth of a perspective employee’s knowledge and experience.

To assist in this process, DEA has developed a standard set of interview questions, consisting of two distinct sections. The first part consists of general IT questions that all perspective examiner personnel should know. A minimal grade for an entry-level position is 80%. The second part consists of questions reserved for those candidates who claim prior computer forensic experience. These questions probe these latter candidates’ depth of knowledge, skills, and abilities. The candidate’s answers are evaluated relative to the level that they are being considered

for (such as a junior, mid-level, or senior position). It is unrealistic to assume that any candidate will know every answer. However, DEA has often been disagreeably surprised to discover that “apparently” well qualified interviewees with multiple IT credentials could not answer basic questions such as “what is a byte?” or “what is digital evidence?”

### General IT Questions

DEA’s general IT test is divided into several subject areas, including: computer hardware, computer operating systems, common software applications, computer networking, and general IT principles. Some sample DEA questions include: Explain the terms Master File Table, gigabyte, partition, POST, and Extended ASCII. What is a Master Boot Record? What are RAM, ROM, and CMOS? What is a thumb drive? What SCSI ID number is needed to boot a SCSI hard drive? What IDE pin number is usually associated with the color strip on the cable? What types of files have the following extensions – DLL, DOC, WPD, PST, XLS, WAV, DBF, and JPG? What is the approximate storage capacity of CDs, Zips, and diskettes? Explain the OSI model. Explain the typical usage of the following software – Eudora,

Quicken, PGP, Adobe Acrobat, Outlook Express, and Lotus Notes. Describe the date and time stamp information associated with modern Microsoft operating system files. What file structures are supported by Windows 98, 2000 and XP?

Additional questions may be appropriate if the candidate indicates that they are familiar with other computer technologies such as Microsoft DOS, Apple, Linux, or Unix. Some sample “other” operating system questions could include: What type of information is contained in a DOS “ini” file? For Linux users, what functions do the dd, loop, mount, and grep commands perform? For a Unix user, a question regarding the function of the shadow file would show understanding of password management.

The candidate’s responses should be sufficiently detailed so as to demonstrate functional understanding of how the operating system operates, stores data, implements file security, and documents user activity.

### **Subject Matter Questions**

Interviews of candidates with extensive prior computer forensics experience and training (who are being considered for a high level position) require a much more in-depth assessment. DEA’s questions touch on several diverse subject areas, including general communication abilities, legal system understanding, technical computer forensic knowledge, and additional technical questions covering computer

hardware, operating systems, and application software. Some sample DEA computer examiner knowledge questions include: What is computer forensics? What is digital evidence? What is the difference between a hard drive duplicate and an image of a hard drive? Compare and contrast the terms physical and logical level data. Explain the terms CRC, carve, and partition slack, free space, write block, and file header.

An excellent question to determine the level of forensic software familiarity can be determined by asking the candidate to identify the most current versions of the computer forensic software (such as Encase, FTK, Ilook, or Safeback) that he/she is using.

A more advanced data format question which most experienced practitioners should be able to answer is: “What types of files are associated with the following file extensions – SAM, QDT, SWP, TAR, and COM?”

It is also recommended that open-ended questions be included in the interview to assess analytic and communication capabilities. A typical open-ended question could be: “What is the significance of the Fourth Amendment to computer search and seizure?”

### **Supplemental Questions**

Some other very important questions in assessing an examiner’s prior work experience include:

*Describe a typical examination.* This question reveals the typical level of effort. Individual organizations examine digital media to different levels depending on need. For example, some examinations are restricted to recovery of child pornographic images, narrow key word searches, or recovery of server logs. This type of examination is not the same as a detailed iterative mining of a hard drive at the sector level, requiring the recovery of file fragments and carving using file signature data.

*How long does it take to perform a typical examination?* This question validates the information provided in the previous question. Basic data recovery from a hard drive should not take more than 1 to 1.5 days (not counting duplication or imaging and report writing). In contrast, deeper investigative examinations can take from 1 to 2 weeks. A productive examiner’s average examination time should be commensurate with the type of examination that is/was required at his/her current or previous computer forensic examination job.

*How many examinations has the interviewee completed in the last 12 months and over the last 36 months?* These questions provide insight into the degree of work experience and depth of analysis. If the answer to the most recent 12 months is less than 20 examinations, the candidate is most likely a part-time examiner. Furthermore, if the candidate answers less than 50

examinations over the last 36 months, they are relatively inexperienced. However, more is not necessarily better - a candidate that answers that they have completed hundreds of examinations in the last 12 or 36 months may have been conducting only very cursory analyses, and he/she may not actually possess much in-depth investigative examination work experience.

*Has the candidate testified as a computer forensic expert witness?* If the candidate answers yes, it is always a good idea to follow up with additional questions in order to better evaluate the actual legal experience of the candidate. Introducing evidence is one thing, but explaining file date and time stamp information, or other technical issues (such as file carving or hashing) in layman's terms show qualitative differences in a person's oral communication skills.

However, if a candidate has not testified in court, that fact should not be considered a disqualification. Presently, the frequency of computer forensic examiners serving as either expert or fact witnesses is very low. However, some court room experience should certainly be viewed as adding to a candidate's well-roundedness.

*What technical courses has the candidate completed in the last 36 months?* This question is another indicator of how current the individual is with state-of-the-art examination software, computer technology, and/or examination techniques.

Technical course titles can vary considerably and the quality of the courses is often difficult to assess. Thus, an impressive resume of such courses may indicate expertise that is "factual but not actual". This indicator should therefore be viewed as a complement to other training and work experience questions.

*Has the individual completed a proficiency test or computer forensics qualification test within the last 18 months (and if so, from what agency)?* The ability to demonstrate competency by passing a recognized qualification or proficiency test is standard quality assurance practice for all forensic science disciplines. Any candidate that has recently passed such a test successfully merits further consideration.

### **Summary Thoughts**

Digital evidence examiner positions, even at the entry level, are not entry level IT positions. A successful examiner needs to have a solid foundation in both theory and practice. Expertise needs to be demonstrated in a number of IT disciplines, including computer networks, hardware, common user and business software, operating systems, programming languages, security, and lastly Internet technologies (such as e-mail and chat). Computer examiner personnel should have credentials and prior work experience commensurate with the position for which they are being considered. Resumes need to be critically evaluated in terms of the scope and depth of the candidate's training and prior work experience. The lack of

any widely recognized industry-wide examiner qualification standards, specialized academic degrees, or standardized certificate programs, are problems that all digital evidence hiring managers face. In the interim, an aggressive interview process is highly recommended to offset the limitations in the average work resume.

Questions or comments?

e-mail: [mphelelan@erols.com](mailto:mphelelan@erols.com)

# Microgram

## *Bulletin*

**Published by:**

**The Drug Enforcement Administration  
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**VOL. XXXVI, NO. 10**

**OCTOBER 2003**

**- INTELLIGENCE ALERT -**

**CODEINE IN “SNOW-CONE” SYRUP IN ONTARIO, CALIFORNIA**

The DEA Southwest Laboratory (Vista, California) recently received an unusual exhibit consisting of four 1-gallon plastic bottles of grape-flavored “snow-cone” syrup, each filled with a viscous purple liquid with a strong grape odor, suspected to contain codeine (see Photo1; note the small glass vial in the foreground showing a sample of the liquid). The exhibit was seized by the DEA Los Angeles Field Division (Riverside) at the United Parcel Service facility in Ontario (about 25 miles east of Los Angeles). Analysis by GC-FID, GC-IR, and GC-MS confirmed codeine. Quantitation by CE with UV detection determined a concentration of 1.1 milligrams/milliliter, equivalent to a net total mass of 16.7 grams of codeine in the four gallons. This amount is equivalent to approximately 2200



**Photo 1**

(normal) adult dosage units. This is the first time the Southwest Laboratory has encountered this type of exhibit.

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**- INTELLIGENCE ALERT -**

**CHOCOLATE/PSILOCYBIN “LOLLIPOP” IN TAMPA, FLORIDA**

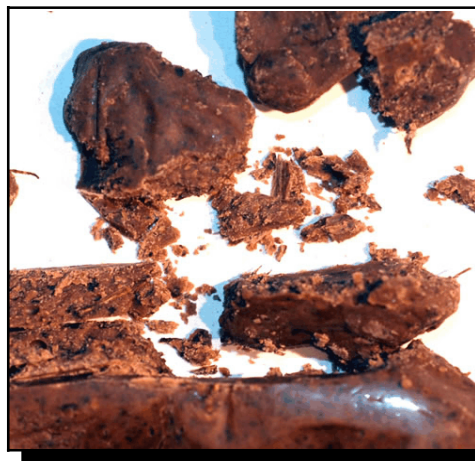
The Florida Department of Law Enforcement Tampa Crime Laboratory (Tampa, Florida) recently received an unusual submission of a chocolate lollipop from the Tampa Police Department. The evidence was recovered at a Grateful Dead Concert in Tampa, and was submitted as a suspected chocolate/psilocybin mushroom concoction. The lollipop was cellophane wrapped, about 6 x 4 centimeters in size (candy only), weighed 27.4 grams (including the stick), and looked and smelled like chocolate candy (see Photo 2).

However, pieces of fibrous material (presumed ground psilocybin mushroom) were visible throughout the chocolate when the lollipop was broken (see Photo 3). Acid/base workup followed by analysis of an extract by GC and GC/MS confirmed psilocin. Extraction of a separate sample of the exhibit with methanol, followed by preparatory TLC, followed by standard TLC, confirmed psilocin (quantitation not performed). Of note, there was no indication of psilocybin in the sample. This was the first encounter with a chocolate/psilocybin (psilocin) concoction by the Laboratory.

[Editor’s Note: Numerous additional examples of chocolate/psilocybin mushroom concoctions were reported in the May, June, and August 2003 issues of *Microgram Bulletin*.]



**Photo 2**



**Photo 3**

\* \* \* \* \*

**- INTELLIGENCE ALERT -**

**COCAINE INSIDE PICTURES IN MEMPHIS, TENNESSEE**

The DEA Mid-Atlantic Laboratory (Largo, Maryland) recently received 11.71 kilograms of white powder, suspected cocaine, concealed within six wood-framed pictures decorated with laminated art prints (see Photo 4, next page). The artwork was seized at the main FedEx facility in Memphis, Tennessee by the U.S. Customs Service, and was subsequently controlled-delivered





**Photo 4**



**Photo 5**

to a location in Alexandria, Virginia. The powder was enclosed in white plastic and tape, then sandwiched between two wooden layers (see Photo 5). The front wooden layer had the art print affixed while the back of the frame was covered in plaster and paint to help conceal the contents. Analysis by GC, FTIR and GC/MS resulted confirmed 40 percent cocaine hydrochloride, adulterated with phenacetin. Although the Laboratory has seen similar exhibits in the past, this concealment method is not commonly encountered.

\* \* \* \* \*

### **- INTELLIGENCE ALERT -**

## **COCAINE BRICKS SMUGGLED IN X-RAY FILM POUCHES IN MIAMI, FLORIDA**

The DEA Southeast Laboratory (Miami, Florida) recently received an unusual submission consisting of 30 packages containing compressed bricks of white powder, suspected cocaine, 29 of them contained in "FilmShield" lead pouches (see Photo 6). "FilmShield" pouches are intended to be used to protect film against airport X-ray damage; their external dimensions are 12 x 6 x 1.5 inches. The exhibits were seized at a hotel in Miami in an undercover operation by the DEA Miami Field Division. The bricks (8 x 5.6 x 1.4 inches) were successively packaged in clear



**Photo 6**

plastic wrap, then a rubber wrap, then another layer of clear plastic wrap, and finally a silver colored tape. Each brick had two logos; the larger looks like the former Eastern Airlines logo, while the smaller is an indistinct eight-sided seal with both a cross and the Peanuts' comic strip character Woodstock (small, stylized bird) in the center (see Photo 7). Analysis of the powder (total net mass 29.98 kilograms) by GC/MS, GC, and IR confirmed 84 percent cocaine hydrochloride. This is the first submission of this type of concealment method to the Laboratory.



**Photo 7**

\* \* \* \* \*

**- INTELLIGENCE ALERT -**

**HEROIN IN LARGE CANDLES IN MEMPHIS, TENNESSEE**

The DEA Northeast Laboratory (New York, New York) recently received an unusual submission from the Department of Homeland Security (Immigration and Customs Enforcement, New York City Office) consisting of 2 pillar candles each containing three discs of compressed tan powder, suspected heroin. The first candle was green and gold in color and approximately 5 inches in height by 4 1/4 inches in diameter, while the second was blue and green in color and approximately 7 1/2 inches in height by 4 1/4 inches in diameter (see Photo 8). The exhibits originated in Buenos Aires, were initially seized at the FedEx facility in Memphis, Tennessee, and were then control-delivered to a location in New York City. Analysis of the powder (total net mass 975 grams) by GC-FID, GC-MS and FT-IR confirmed 85 percent heroin hydrochloride, adulterated with lidocaine. This is the first submission of heroin in candles to the Laboratory.



**Photo 8**

[Editor's Note: A review of the *Microgram* archives indicate that there have been no previous reports of powdered heroin smuggled inside candles. However, a similar seizure of cocaine in a candle was reported in the September 2003 issue of *Microgram Bulletin*, and a seizure of cocaine base "secreted in the base of religious candles" (not clear if inside the candle, or inside separate bases that held the candles) was reported in the December 1986 issue of *Microgram*.]

**- INTELLIGENCE BRIEF -**

**MULTI-COMPONENT ECSTASY TABLETS WITH A STAR LOGO  
IN SCOTTSDALE, ARIZONA**

The Scottsdale Police Department Crime Laboratory (Scottsdale, Arizona) recently received two yellow tablets with a star logo, suspected ecstasy (see Photo 9). The tablets (total net mass 469 milligrams) were included as a “freebie” during an undercover purchase of cocaine made in Scottsdale by the Scottsdale Police Department, and were sold identified only as “pills to party with”. Analysis by color testing and MS, however, indicated not only MDMA but also methamphetamine, ephedrine, caffeine, lidocaine, and ketamine. The exhibits were not formally quantitated; however, the MDMA, methamphetamine, and ketamine were present in an approximate 2:1:1 ratio. This is the first submission of this type to the Crime Laboratory.



**Photo 9**

\* \* \* \* \*

**- INTELLIGENCE BRIEF -**

**CAPSULES CONTAINING POWDERED PSILOCYBIN MUSHROOMS  
IN COUNCIL GROVE, KANSAS**

The Kansas Bureau of Investigation Laboratory in Topeka recently received a submission of seven clear capsules containing a light brown powder (total net mass not reported) from the Council Grove Police Department (Council Grove is located about 50 miles southwest of Topeka). The capsules (see Photo 10) were seized (along with several ounces of marijuana) subsequent to a DUI/vehicle stop. The defendant indicated that the capsules were “mushroom pills”. Analysis by TLC indicated psilocin and psilocybin, and analysis by GC/MS confirmed psilocin (quantitation not performed). This was the Laboratory’s first encounter with this type of exhibit; however, a similar exhibit was seen by the KBI Great Bend Laboratory in 2002.



**Photo 10**



**- INTELLIGENCE BRIEF -**

**PEYOTE BUTTONS  
IN ARCATA, CALIFORNIA**

The State of California Forensic Laboratory in Eureka recently received a submission of 11.02 grams of peyote buttons (see Photo 11; note that both sides of the buttons are displayed). The exhibits were seized by the Arcata Police Department (circumstances of seizure not reported); Arcata is a college town housing Humboldt State University, located about 10 miles north of Eureka. Analysis by GC/MS confirmed mescaline (3,4,5-trimethoxyphenethylamine); quantitation not performed. This was the first peyote case seen at the Laboratory in about three years.



**Photo 11**

\* \* \* \* \*

**- INTELLIGENCE BRIEF -**

**PEYOTE CACTUS AND ROOTS IN HEBBRONVILLE, TEXAS**

The DEA South Central Laboratory (Dallas, Texas) recently received a seizure of suspected peyote cactus bulbs (buttons) and roots from Hebbronville, Texas (located about 50 miles east southeast of Laredo) (see Photo 12). The exhibits (total net mass 4.034 kilograms, damp) were seized by the U.S. Border Patrol during a vehicle stop just south of the town. Analysis by GC and GC/IR confirmed mescaline (quantitation not performed). Although the Laboratory has seen over 100 exhibits of peyote since 1970, this is the first exhibit received in about two years.



**Photo 12**

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## CALL FOR PAPERS FOR *MICROGRAM JOURNAL*

As of the completion of the third quarter of Calendar Year 2003 (September 30, 2003), only four manuscripts had been submitted for publication in the next (July - December, 2003) issue of *Microgram Journal*, and four additional manuscripts (detailed below) have been promised. The DEA Office of Forensic Sciences continues to invite the submission of both Technical Notes and full-length Scientific Articles for consideration for publication in the *Journal*. Towards that end, the following suggestions are offered as possible research topics:

### Currently Promised

The following manuscripts have been promised, but are provided so that other researchers can see examples of the types of research articles that are needed:

- A) Detailed Botanical Identification of *Salvia Divinorum*.
- B) Comprehensive Spectral and Chromatographic Data for Salvinorin A, B, and C.
- C) Comprehensive Spectral and Chromatographic Data for Nandralone Cypionate.
- D) Comprehensive Spectral and Chromatographic Data for 5-Methoxy-*alpha*-methyltryptamine (5-MeO-AMT) (one submitted; two others promised).

### Ideas

- A) Improved Color Test for Ketamine.
- B) Comprehensive Spectral and Chromatographic Data for Carisoprodol.
- C) Time Study of the Decomposition of Illicit Drugs Upon Extended Vault Storage.
- D) "Marker" Impurities that Establish the Use of Home-Made Anhydrous Ammonia in the Lithium/Ammonia or Sodium/Ammonia Reduction ("Nazi") Synthesis of Methamphetamine.
- E) Statistical Analysis of Large Bags of Mixed Logo/Mixed Color MDMA Tablets - Are Isolation and Separate Analyses Necessary?

[Expansion: Large exhibits of MDMA tablets often consist of complex mixtures of tablets with a wide variety of logos and colors. Standard operating procedures in many forensic laboratories require isolation and separate analyses for each tablet type, a very tedious and time-consuming operation. Recent seizures of very large MDMA laboratories in Malaysia, Canada, and elsewhere, where multiple tablet dies and a variety of food coloring additives were found, suggest that the chemical compositions of all the tablets from those operations are highly similar, and therefore do not need to be

separately analyzed. A detailed statistical study of this phenomenon is needed, analyzing (if possible) the seizures from such large laboratories, and also analyzing multiple “field” seizures of bags of hundreds/thousands of mixed tablets.]

F) Identification of Licit versus Illicit Commercial Drugs.

G) Methods Used (by an Individual Laboratory or Laboratory System) to Identify Synthetic Routes Used to Produce Illicit Drugs.

H) Mini-Reviews (separate manuscripts for each topic) on the Current State of:

Marijuana DNA Analysis

Analysis of Human Growth Hormone (HGH)

Analysis of GHB and GBL

Bench-Top Raman Spectroscopy for Analysis of Illicit Drugs

Portable Raman Spectroscopy for Analysis of Substances at Clandestine Laboratory Sites

ICP/MS for Analysis of Illicit Drugs

Miniaturized/Portable/Field Rugged GC/MS for Analysis of Substances at Clandestine Laboratory Sites

IMS for Detection and Analysis of Substances at Clandestine Laboratory Sites (and Similar Venues)

SPME for Analysis of Illicit Drugs

Guidelines for Authors were published in the January - June, 2003 of the *Journal*, and are also posted on the *Microgram* website.

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## LAST CALL FOR EMAIL ADDRESSES

The following alphabetized list represents domestic (U.S.) organizations that have dropped off the *Microgram* subscription e-net. Most of these organizations never responded to last year’s multiple subscription re-validation requests. Some represent offices or laboratories that closed years or even decades ago. A few others provided invalid email addresses, or provided email addresses that have since become invalid.

The Office of Forensic Sciences requests your assistance in tracking down these organizations, and (if they are still interested in receiving *Microgram Bulletin* and *Microgram Journal*) asking them to provide an accurate email address to the *Microgram* Editor. Note that personal names and/or street addresses have been redacted for security reasons; however, the provided information should be adequate to identify those organizations that are still operational. If the office or laboratory has closed or consolidated, or is simply not interested in remaining on the subscription e-net, that information would also be appreciated. All responses should be emailed to the Editor at: [microgram\\_editor@mailsnare.net](mailto:microgram_editor@mailsnare.net)

An equivalent listing of foreign organizations will be provided in the November issue of *Microgram Bulletin*. All organizations for which no response is received will be deleted from the subscription database at the end of this year.



Organization	Office	City	State
4th Judicial Circuit of FL - Toxicologist Office Med Exam		Jacksonville	FL
Alabama Dept of Forensic Sciences	Florence Laboratory	Florence	AL
Alameda County Coroners Dept		Oakland	CA
Albany State University	Criminal Justice Dept/Forensic Science	Albany	GA
Albuquerque Police Dept	Metropolitan Forensic Science Center	Albuquerque	NM
Albuquerque Scientific Laboratory Division	Toxicology Laboratory	Albuquerque	NM
Am Embassy Muscat - Admin Counsel		Washington	DC
Anaheim Police Dept	Major Narcotic Unit	Anaheim	CA
Anderson Police Dept		Anderson	IN
Andrews AFB - Drug Investigations Program Manager	HQ-AFOSI	Andrews AFB	MD
Arizona Dept Of Public Safety	Western Regional Crime Laboratory	Lake Havasu City	AZ
Armed Forces Inst Of Pathology		Washington	DC
ASCLD/LAB		Garner	NC
Baltimore Chief Medical Examiner		Baltimore	MD
Baltimore College Of Dental Surgery	University of MD At Baltimore	Baltimore	MD
Bensalem Township Police	Special Investigation Unit	Bensalem	PA
Bergen Pines County Hospital	Research & Development	Paramus	NJ
Bernalillo County Sheriff's Dept	Criminalistics	Albuquerque	NM
Berrien County Forensic Lab	Andrews University	Berrien Springs	MI
Box Elder County Sheriff Crime Laboratory		Brigham	UT
British Embassy - Drug Liaison Office		Washington	DC
Brooke Army Medical Center	Dept Of Pathology	Fort Sam Houston	TX
Brooks AFB - Armstrong Laboratory	Quality Control	Brooks AFB	TX
Brooks AFB - Drug Screening Lab	Quality Assurance	Brooks AFB	TX
Brooks AFB - Us Dept Of The Air Force	AF Institute For Environment Risk Assessment, AFMC	Brooks AFB	TX
Broward County Office Of The Medical Examiner		Fort Lauderdale	FL
Buffalo State College		Pendleton	NY
Bureau Of Crim Ident And Invest	East Central Laboratory	Byesville	OH
Bureau Of Narcotic Enforcement		Fresno	CA
Burlington County Forensic Science Lab		Mt. Holly	NJ
CA Dept Of Just/Bur Of Narc Enforcement	Clan. Lab. Enforcement Prg.	Sacramento	CA
California Dept Of Health Services	Food & Drug Laboratory	Emeryville	CA
Calvert Forensic Enterprises		Harvard	IL
Canyon County Sheriff's Office		Caldwell	ID
CDPHE		Denver	CO
Chadron Police Dept		Chadron	NE
Chapel Hill Chief Medical Examiner Office		Chapel Hill	NC
Charleston Police Dept Forensic Laboratory		Charleston	SC
Chicago Police Dept	Forensic Science Section	Chicago	IL

Organization	Office	City	State
Chula Vista Police Dept	Narcotics Enforcement Team (NET)	Chula Vista	CA
Clark College - Administration Of Justice		Vancouver	WA
College Of Soc & Behav Sci - Dept Of Criminology		St Petersburg	FL
College Of The Southwest - Carlsbad	Criminal Justice Dept	Carlsbad	NM
Collier County Sheriff's Office	Crime Laboratory	Marco	FL
Columbia Police Dept	Drug Analysis Laboratory/Crime Scene Unit	Columbia	SC
Columbus Hospital Toxicology Dept		Great Falls	MT
Cook County Hospital		Chicago	IL
Cook County Office Of The Medical Examiner	Toxicology Laboratory	Chicago	IL
Costa Mesa Police Dept		Costa Mesa	CA
Cuyahoga County Coroner's Office		Cleveland	OH
Daviess County Sheriff's Dept		Owensboro	KY
Daytona Beach Reg Crime Lab		Daytona Beach	FL
DC Medical Examiner	Forensic Toxicology Laboratory	Washington	DC
Denver Police Dept	Crime Laboratory	Denver	CO
Dept Of Trans Div Of Sp (???)		Madison	WI
DHEW Food And Drug Administration		Buffalo	NY
Director, Anal Chem Division	Bureau Of Laboratories	Columbia	SC
Div Of Laboratories (???)		Washington	DC
Div Of Pharm. Serv/Drug Contr. (???)		Little Rock	AR
Division Of Forensic Toxicology (???)		Rockville	MD
DoD Computer Forensics Laboratory	Air Force Office Of Special Investigations	Linthicum	MD
Dorthea Dix Hospital		Raleigh	NC
Dubuque Police Dept		Dubuque	IA
Eastern Nebraska Forensic Laboratory		Omaha	NE
Eastern Washington University	Dept Of Chemistry And Biochemistry	Cheney	WA
El Paso County Coroner's Office		Colorado Springs	CO
Elyria City Dept Health Lab		Elyria	OH
EPI	Div Of Alcohol & Drug Abuse	Trenton	NJ
Erie County Medical Ctr	Toxicology Laboratory	Buffalo	NY
Eugene Police Dept		Eugene	OR
Everett Medical Examiner's Office		Everett	WA
Everett Police Dept	Drug Enforcement Unit	Everett	MA
FBI Academy Library	Government Documents	Quantico	VA
Florida Dept Of Law Enforcement	Jacksonville Regional Crime Lab	Jacksonville	FL
Florida Dept Of Law Enforcement	Daytona Beach Regional Crime Lab - Chem Section	Daytona Beach	FL
Forensic Analytical Serv. & Testing Inc		Bessemer City	NC
Forensic Sci Resch & Trng Ctr		Quantico	VA
Forensic Science Institute of Puerto Rico	Regional Laboratory	Aguadilla	PR
Forensic Science Institute of Puerto Rico	Regional Laboratory	Ponce	PR
Forensic Science Institute of Puerto Rico	Regional Laboratory	Arecibo	PR

Organization	Office	City	State
Fort Bliss Toxicology Branch	Dept Of Pathology	Fort Bliss	TX
Fort Devens Field Office		Fort Devens	MA
Fort Eustis Field Office		Fort Eustis	VA
Fort Gordon - DDEAMC	Dept Of Pathology	Fort Gordon	GA
Fort Knox District		Fort Knox	KY
Fort Lauderdale Police Dept	Attn: Investigative Bureau	Fort Lauderdale	FL
Fort Leonard Wood Office of (???)		Fort Leonard Wood	MO
Fort Monmouth Resident Agency		Fort Monmouth	NJ
Fort Pierce Regional Crime Laboratory		Fort Pierce	FL
Forth Worth Police Dept Crime Lab		Fort Worth	TX
Frankfort Chemistry Laboratory		Frankfort	KY
Fremont Police Dept	Narcotics Unit	Fremont	CA
Ft Hamilton Res Agency		Fort Hamilton	NY
Gauilan College	Admin Of Justice	Gilroy	CA
Geo Wash Univ Med Center	Dept Of Emergency Medicine	Washington	DC
Georgia State Crime Laboratory	Drug Identification Section	Atlanta	GA
Glendale Crime Lab		Milwaukee	WI
Grand Junction Police Dept Laboratory		Grand Junction	CO
Grand Rapids Police Dept	Crime Laboratory	Grand Rapids	MI
Great Lakes Laboratories		Michigan City	IN
Greenwood Police Dept	Crime Laboratory	Greenwood	IN
Gregg County Sheriffs Dept.	Criminal Investigations Division	Longview	TX
Halt Pharmacist/DOT Pharmacy Supervisor		Los Angeles	CA
Hamburg Township Police Dept		Hamburg	MI
Harris Labs Inc		Lincoln	NE
Hartford Police Dept	Crime Laboratory	Hartford	CT
Harvard University - J.F. Kennedy School Of Govt	Dept Of Criminal Justice Policy	Cambridge	MA
Hawaii County Office Of Prosecuting Attorney		Hilo	HI
Hawaii State Laboratories Division		Pearl City	HI
Hennipen County Medical Ctr	Dept Of Clinical Laboratories	Minneapolis	MN
Hermosa Beach Police Dept		Hermosa Beach	CA
Hillsborough County Medical Examiner Dept		Tampa	FL
Houston Advanced Research Ctr		The Woodlands	TX
HQDA (SGPS-FP)		Falls Church	VA
Idaho State University	Dept Of Pharmacology/Toxicology	Pocatello	ID
Illinois Dept Of Health	McHenry County	Woodstock	IL
Illinois State Police	Intelligence Bureau	Springfield	IL
Illinois State Police	Tactical Response Team	Couinsville	IL
Independence Police Dept	Special Investigations Lab	Independence	MO
Indiana Univ Med Cntr	Dept Of Forensic Pathology	Indianapolis	IN
Inglewood Police Dept Crime Lab		Inglewood	CA
Institute of Addiction (???)	Library Central States	Chicago	IL
International Assoc Of Forensic		Newport Beach	CA

Organization	Office	City	State
Toxicology			
INTERPOL-USNCB	US Department Of Justice	Washington	DC
Intl Crim Inv Training Asst Prg		Washington	DC
Iola Police Dept		Iola	KS
Jacksonville Dept HRS		Jacksonville	FL
Jacksonville Naval Air Station		Jacksonville	FL
Jacksonville Sheriff's Office		Jacksonville	FL
Jefferson County Sheriff's Dept	Attn: Criminalistics Unit	Golden	CO
Kalamazoo Police Dept	Crime Laboratory	Kalamazoo	MI
Kansas City Police Crime Laboratory		Kansas City	MO
Kansas City, Kansas Police Dept	Special Enforcement Unit	Kansas City	KS
Kenosha Health Dept Laboratory		Kenosha	WI
Kenosha Sheriff Dept		Kenosha	WI
Kentucky State Police	Northern Regional Laboratory	Cold Springs	KY
King County Medical Examiner		Seattle	WA
Knox County Narcotics Division		Knoxville	TN
La Police Dept Detective Division	Crime Laboratory	Van Nuys	CA
Laboratory of Forensic Sciences (???)		Corning	NY
Lake Charles Memorial Hospital	Toxicology/Pathology	Lake Charles	LA
Lake Superior State College		Sault Ste Marie	MI
Lancaster Water Control Board		Lancaster	PA
Lansing Police Dept	Special Operations Division	Lansing	MI
LAPD Central Area		Los Angeles	CA
Law Enf. & Sec. Training Div (???)	Narcotics Training Group	College Station	TX
Leavenworth Police Dept	Leavenworth County Drug Task Force	Leavenworth	KS
Licking County Sheriffs Dept	Forensic Laboratory	Newark	OH
Linn County Medical Examiner	Mercy County Blairs Ferry	Hiawatha	IA
Lorain County Water Pollution Control Plant		Lorain	OH
Macomb County Comm College	Law Enforcement Program	Clinton Twp.	MI
Madison Controlled Substances Board		Madison	WI
MAGLOCLN		Newtown	PA
Mallinckrodt Baker, Inc.		Phillipsburg	NJ
Maryland State Dept Of Health		Baltimore	MD
Maryland Transportation Authority Police	Tunnel Command	Baltimore	MD
Maryville College	Chemistry Dept	Maryville	TN
Maui Police Dept Crime Laboratory		Wailuku	HI
Medical College Of Virginia		Richmond	VA
Memphis Police Dept	Crime Response Unit	Memphis	TN
Mercy Hospital		Hamilton	OH
Miami-Dade Crime Laboratory		Miami	FL
Military Police		Oakland	CA
Milwaukee Cnty Medical Examiner		Milwaukee	WI
Minneapolis Police Dept	Identification Division	Minneapolis	MN
Mississippi Bureau Of Narcotics		Jackson	MS

Organization	Office	City	State
Monroe County Sheriffs Office		Key West	FL
Montana Board Of Pharmacy		Helena	MT
Montana State Attorney General		Helena	MT
Montrose Police Dept	Forensic Science Laboratory	Montrose	CO
Napa County Sheriffs Dept	Crime Laboratory	Napa	CA
Napa Police Dept		Napa	CA
Natchez Police Dept	Drug Laboratory	Natchez	MS
National Sheriffs Association		Alexandria	VA
Naval Criminal Investigative Service	Regional Forensic Laboratory - San Diego	San Diego	CA
Naval Research Laboratory	Forensics	Washington	DC
Netherlands Embassy		Washington	DC
New Hampshire Dept Of Corrections	Drug Testing Laboratory	Laconia	NH
New Jersey State Med Examiner		Newark	NJ
New Jersey State Police	Southern Regional Laboratory	Hammonton	NJ
New Orleans Coroner's Office	Forensic Laboratory	New Orleans	LA
New York Police Dept Crime Laboratory		Jamaica	NY
Newark Police Dept	Forensic Services	Newark	OH
NIDA Addiction Research Ctr	Chemistry Laboratory	Baltimore	MD
Norman Police Dept		Norman	OK
North Dakota State Dept Of Health Labs	Forensic Science Division	Bismarck	ND
North Dakota State Lab & Consumer Affairs	State Laboratory	Bismarck	ND
OCSD - Forensic Science Services		Buena Park	CA
Office Of The Chief Medical Examiner		South Charleston	WV
Office Of The Chief Medical Examiner		Washington	DC
Office Of The Coroner	Chemistry Dept	Akron	OH
Office Of The Coroner		San Rafael	CA
Office Of The District Attorney	Major Narcotics Vendor Prosecution	Modesto	CA
Office Of The Medical Examiner	Toxicology Laboratory	San Diego	CA
Office Of The Medical Examiner		East Meadow	NY
Ohio Investigative Unit		Columbus	OH
Oklahoma City - Toxicology & Accident Research Laboratory		Oklahoma City	OK
Oklahoma State Bureau Of Investigation		Edmond	OK
Oklahoma State Medical Examiner		Oklahoma City	OK
Onondaga County Center For Forensic Sciences		Syracuse	NY
Orange County Sheriff's Office		Orlando	FL
Oregon State Police	Forensic Services	Eugene	OR
Oregon State Police	Ontario Forensic Laboratory	Ontario	OR
Ormsby County Sheriff's Office		Carson City	NV
PA State Police - Carlisle Barracks		Carlisle Barracks	PA
Palm Beach Sheriff's Crime Laboratory	Technical Services	West Palm Beach	FL
Panama City Medical Examiners Office	District 14	Panama City	FL
Pasadena Police Dept	Vice Narcotic Bureau	Pasadena	CA

Organization	Office	City	State
Pennsylvania Dept Of Health	Bureau Of Laboratories	Exton	PA
Peterson AFB - 21st Security Police Squad		Peterson AFB	CO
Placer County Dist Atty Crime Laboratory		Auburn	CA
Prince George's County Police Dept	Forensic Services Division	Landover	MD
Public Health Chemist		Minneapolis	MN
Racine Health Dept		Racine	WI
Renton Police Dept	Invest. Div, Narcotics Unit	Renton	WA
Richland County Sheriff's Department		Colombia	SC
Richmond Police Dept	Crime Laboratory	Richmond	IN
Richmond Police Dept	Vice/Narcotics Unit	Richmond	CA
Riverton Police Dept		Riverton	WY
Rock Hill Forensic Laboratory		Rock Hill	SC
Rockland County Medical Examiners Office		Pomina	NY
Rocky Mntn Poison & Drug Ctr		Denver	CO
Saginaw County Department Of Public Heal	Laboratory Services Division	Saginaw	MI
Salt Lake City County Toxicology Laboratory		Salt Lake City	UT
Salt Lake City Police Crime Laboratory		Salt Lake City	UT
San Antonio Police Dept	Evidence Unit	San Antonio	TX
San Bernardino Police Dept	Attn Vice/Narcotics	San Bernardino	CA
San Bernardino Toxicology Laboratory	Anatomic, Neuro, and Forensic Pathology	San Bernardino	CA
San Diego County	Office Of The Sheriff	San Diego	CA
San Francisco Bay Area Quality Mgt Dist		San Francisco	CA
San Mateo Police Dept	Crime Laboratory	San Mateo	CA
Santa Ana Police Dept	Crime Laboratory	Santa Ana	CA
Santa Barbara County Sheriff - Coroner		Santa Barbara	CA
Santa Rosa Regional Lab		Santa Rosa	CA
Sarasota Sheriff's Office		Sarasota	FL
Scottsdale Police Dept	Crime Laboratory	Scottsdale	AZ
Sewald Labs		Williamsport	PA
Smith Kline Clinic Lab Inc		Schaumburg	IL
South Dakota Division Criminal Investigation	Crim Just Trng Cntr	Pierre	SD
Southern Calif Public Health Laboratory		Los Angeles	CA
Southfield Crime Lab		Southfield	MI
St Agnes Hospital		Baltimore	MD
St Joseph Dept Of Police		St Joseph	MO
St Joseph Medical Center		Ponca City	OK
St Joseph's Prosecutor's Office		St Joseph	MI
St Paul Police Department - Crime Lab		St Paul	MN
St Tammany Parish Sheriff's Office	Crime Laboratory	Covington	LA
St. Johns University / St. Vincents College	Dept Of Criminal Justice (Forensic Science Minor)	Jamaica	NY



Organization	Office	City	State
Stanislaus Drug Enforcement Agency		Modesto	CA
Stillwater Police Dept		Stillwater	OK
Stockton Police Crime Laboratory		Stockton	CA
Syracuse Police Laboratory		Syracuse	NY
Tennessee Bureau Of Investigation	Crime Lab - Memphis - Drug Section	Memphis	TN
Tennessee Bureau Of Investigation Crime Lab	Regional Crime Laboratory	Jackson	TN
Texas A & M University	College Of Veterinary Medicine	College Station	TX
Texas Dept Of Public Safety	Crime Laboratory	El Paso	TX
Texas Dept Of Public Safety	Crime Laboratory	Abilene	TX
The Lab for Chromatography		Lawrence	NY
Town Of Cohasset Police Department	Narcotics Section	Cohasset	MA
Trenton Police Dept		Trenton	NJ
Trinidad State Jr Coll	Law Enforcement Academy	Trinidad	CO
Trumbell County Coroners Office		Warren	OH
Tulsa City County Health Dept		Tulsa	OK
Tupelo Crime Laboratory		Tupelo	MS
UCLA School Of Public Policy		Los Angeles	CA
Ukiah Sheriff's Office		Ukiah	CA
Univ Colorado/Health Sciences	Dept. Prev. Med. & Biometrics	Denver	CO
Univ Of Nebraska, College Of Pharmacy	Dept Of Biomedical Chem	Omaha	NE
Univ Of Oregon Dental School	Dept Of Pharm	Portland	OR
Univ Of Texas Mental Sci Inst	Urine Drug Screening Program	Houston	TX
University Of California	School Of Vet Medicine	Davis	CA
University Of Georgia	Veterinary Diagnostic Laboratory	Tifton	GA
University Of Miami - Forensic Toxicology Lab		Miami	FL
University Of Missouri - Toxicology Laboratory		Columbia	MO
University of Tennessee	Toxicology Laboratory	Memphis	TN
US Coast Guard - Investigations		Alameda	CA
US Customs Service	Contraband Enforcement Team	Elizabeth	NJ
US Dept of Agriculture (USDA)	Analytical Services	Laramie	WY
US Dept of Justice	Federal Prison System	Lexington	KY
US Dept of Justice		Washington	DC
US Dept of Justice, Northern Dist Of NY	Organized Crime And Racketeering Section	Syracuse	NY
US Dept of State - Narc Coord		Washington	DC
US Dept of The Navy		San Diego	CA
US Environmental Protection Agency (EPA)	Region 3	Philadelphia	PA
US Environmental Protection Agency (EPA)	Region 10	Port Orchard	WA
US Naval Medical Center - Clinical Chemistry	Laboratory Administration	Bethesda	MD
USACIDC - Aberdeen Proving Ground		Aberdeen	MD
USACIDC - Seventh Region		APO San Francis.	CA

Organization	Office	City	State
USACIDC, Third Region		Fort Meade	MD
USAE SFUR (ICITAP) - HQ		West Palm Beach	FL
Utah Bureau Of Forensic Services	Northern Laboratory	Ogden	UT
Utah Dept Of Public Safety	Central Utah Criminalistics Laboratory	Salt Lake City	UT
Vancouver Police Dept		Vancouver	WA
Vincennes Police Dept	Forensic Services	Vincennes	IN
Virgin Islands Office Of Commissioner Of Police	Crime Laboratory	St. Thomas U.S.	VI
Virgin Islands Ter. Crime Lab	Patrick Sweeney HQs	Kings Hill, St Croix	VI
Virginia Public Safety Foundation		Richmond	VA
Wake County ABC Law Enforcement		Raleigh	NC
Wake County Bureau Of Investigation		Raleigh	NC
Warwick Police Dept		Warwick	RI
Washington State University	College Of Pharmacy	Pullman	WA
Washoe County Sheriff's Office		Reno	NV
Waynesburg College	Forensic Science Program	Waynesburg	PA
West Covina Police Dept		West Covina	CA
West Point Resident Agency	Attn: CIRC-WWP	West Point	NY
West Valley City Police Dept	Forensic Services Unit	West Valley City	UT
West Virginia University	Forensic Identification Program	Morgantown	WV
West Warwick Police Dept		West Warwick	RI
Westchester County Sheriffs Office		White Plains	NY
Western States Info Network		Sacramento	CA
Whittier Crime Laboratory		Whittier	CA
Wichita Police Dept Crime Lab	Lab Section	Wichita	KS
Wichita Sheriffs Office		Wichita	KS
Wildwood Police Dept Laboratory		Wildwood	NJ
Will County Health Dept		Joliet	IL
Wisconsin State Laboratory of Hygiene - Toxicology	Univ. Of Wisconsin - Environmental Health Division	Madison	WI
Wright-Patterson AFB - AFOSI DET 101/FSO		Wright-Patterson AFB	OH
Wyoming Dept Of Public Health	Chemical Testing Program	Cheyenne	WY
York County Sheriff's Office		York	SC
Young Laboratories		Waterville	ME
Youngstown Police Dept	Crime Lab And Records	Youngstown	OH

\* \* \* \* \*

## SELECTED REFERENCES

[Note: Selected references are a compilation of recent publications of presumed interest to forensic chemists. Unless otherwise stated, all listed citations are published in English. If available, the email address for the primary author is provided as the contact information. Listed mailing address information (which is sometimes cryptic or incomplete) exactly duplicates that provided by the abstracting services.]

1. Titterton E, Carter J, Murray M, Sleeman R. **Characterisation [sic] of ecstasy tablets by isotope ratio mass spectrometry.** Proceedings of the 16th Meeting of the International Association of Forensic Sciences, Montpellier, France, September 2-7, 2002, pps 111-115. [Editor's Notes: MDA- and MDMA-based Ecstasy tablets were analyzed for deuterium, carbon-13, and nitrogen-15 to derive a isotopic fingerprint. Deuterium substitution was also determined via deuterium NMR. Contact: Mass Spec Analytical Limited, Bristol, UK (no further addressing information provided).]
2. Alghanim HJ, Almirall JR. **Development of microsatellite markers in cannabis sativa for DNA typing and genetic relatedness analyses.** Analytical and Bioanalytical Chemistry 2003;376(8):1225. [Editor's Notes: Presents a DNA analysis for marijuana. Contact: Florida International University, International Forensic Research Institute (IFRI), Department of Chemistry, University Park, Miami, FL 33314.]
3. Ottaviano V, Furnari C, Rosati F. **Identification of di(beta-phenylisopropyl)amine as the main ingredient in illicit amphetamine tablets.** Annali dell'Istituto Superiore di Sanita 2002;38(3):331. [Editor's Notes: Presents the identification of the title compound as the primary ingredient in several sets of amphetamine tablets sold in Rome during 1999-2000. Contact: Dipartimento di Sanita Pubblica, Laboratorio di Tossicologica Forense, Universita degli Studi "Tor Vergata", Rome, Italy.]
4. King L. **What's in a drug?** Druglink 2003;18(4):21. [Editor's Notes: Presents a minor survey of the typical contents of illicit drugs. Contact information not provided.]

### Additional References of Possible Interest:

1. Ruiz R, Rafols C, Roses M, Bosch E. **A potentially simpler approach to measure aqueous pKa of insoluble basic drugs containing amino groups.** Journal of Pharmaceutical Sciences 2003;92(7):1473. [Editor's Notes: Presents a method for determining pKa's via extrapolation from values determined in methanol/water mixtures. Title drugs include imipramine, maprotiline, nortriptyline, trazadone, and trimipramine. Contact: [bosch@apolo.qui.ub.es](mailto:bosch@apolo.qui.ub.es)]
2. Epstein DM, Tebbett IR, Boyd SE. **Eliminating sources of pipetting error in the forensic laboratory.** Forensic Science Communications 2003;5(4):No Page Number (Internet Reference: [www.fbi.gov/hq/lab/fsc/current/index.htm](http://www.fbi.gov/hq/lab/fsc/current/index.htm)) [Editor's Notes: Presents an overview of the potential sources of error when utilizing air-displacement pipettes. Contact: National Forensic Science Technology Center, Largo, MD (zip code not provided).]
3. Bartick E. **Forensic analysis by Raman spectroscopy: An emerging technology.** Proceedings of the 16th Meeting of the International Association of Forensic Sciences, Montpellier, France, September 2-7, 2002, pps 45-50. [Editor's Notes: Presents a general

introduction and review of Raman for forensic analysis. Contact: Counterterrorism and Forensic Science Research Unit, FBI Academy, Quantico, VA (zip code not provided).]

4. Sun Q. **Novel method for identifying Chinese herbal medicine.** Faming Zhuanli Shenqing Gongkai Shuomingshu CN 1370839 A 25 Sept 2002, 6 pp. CLASS: ICM: C12Q001-25. APPLICATION: CN 2001-104457 27 Feb 2001. [Editor's Notes: Presents an application of PCR with Taq enzyme to identify Chinese herbal medications. This patent is written in Chinese. Contact: Peop. Rep. China (no further addressing information provided).]
5. Ballou S, Goodpaster J, MacCrehan W, Reeder, D. **Forensic Analysis.** Analytical and Bioanalytical Chemistry 2003;376(8):1149. [Editor's Notes: No details provided in abstract. Contact: 100 Bureau Drive, Office of Law Enforcement Standards, National Institute of Standards and Technology, STOP 8102, Gaithersburg, MD 20899.]
6. Gaensslen RE. **How do I become a forensic scientist? Educational pathways to forensic science careers.** Analytical and Bioanalytical Chemistry 2003;376(8):1151. [Editor's Notes: No details provided in abstract. Contact: College of Pharmacy, Department of Biopharmaceutical Science, Forensic Science Program, Director of Graduate Studies, University of Illinois at Chicago, Chicago, IL 60612.]
7. Almirall JR, Furton KG. **Trends in forensic science education: Expansion and increased accountability.** Analytical and Bioanalytical Chemistry 2003;376(8):1156. [Editor's Notes: No details provided in abstract. Contact: Department of Chemistry, International Forensic Research Institute, Associate Director and Director, Florida International University, University Park, Miami, FL 33199.]
8. Negrusz A, Gaensslen RE. **Analytical developments in toxicological investigation of drug-facilitated sexual assault.** Analytical and Bioanalytical Chemistry 2003;376(8):1192. [Editor's Notes: Presents a general overview of the drug-facilitated sexual assault phenomenon, and discusses recent analytical/toxicological developments to detect same. Contact: College of Pharmacy, Department of Biopharmaceutical Science (M/C 865), Forensic Science Program, University of Illinois at Chicago, 833 South Wood Street, Chicago, IL 60612.]
9. Lorenzo N, Wan TL, Harper RJ, Hsu Y-L, Chow M, Rose S, Furton KG. **Laboratory and field experiments used to identify Canis lupus var. familiaris active odor signature chemicals from drugs, explosives, and humans.** Analytical and Bioanalytical Chemistry 2003;376(8):1212. [Editor's Notes: Presents the use of headspace-SPME-GC to identify the odors that dogs alert to when searching for the title targets (listed drugs include cocaine and MDMA). Contact: Florida International University, Department of Chemistry and International Forensic Research Institute (IFRI), University Park, Miami, FL 33199.]
10. Fitsev IM, Budnikov GK, Blokhin VK, Teslenko PG. **Gas chromatographic determination of diacetylmorphine with mass spectrometric detection.** Journal of Analytical Chemistry (English translation of Zhurnal Analiticheskoi Khimii) 2003;47(9-12):423. [Editor's Notes: Appears to be a GC/MS method for analysis of heroin in fluids (not clear in abstract). Contact: Forensic Examination Center, Ministry of Internal Affairs of Tatarstan, ul. Dzerzhinskogo 19, Kazan Tatarstan 420503, Russia.]
11. Kuznetsov PE, Aparkin AM, Zlobin VA, Nazarov GV, Kosterin PV, Lyubun' EV, Shcherbakov AA. **Analysis of opiates by spin-lattice relaxation techniques.** Pharmaceutical Chemistry

Journal (English translation of Khimiko-Farmatsevticheskii Zhurnal) 2002;36(6):331. [Editor's Notes: Presents the use of the title technique to detect opiates in plasma. Contact: Saratov State University, Saratov, Russia (no further addressing information provided).]

12. Page K. **Forensic science: Reformers aim to shake up British system.** Science 2003;301(5633):579. [Editor's Notes: No details provided in abstract. Contact information not provided.]

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## THE JOURNAL/TEXTBOOK COLLECTION EXCHANGE

### *FREE TO ANY SUBSCRIBER*

Unless otherwise noted, requests for any of the following offerings should be emailed to the *Microgram* Editor at: [microgram\\_editor@mailsnare.net](mailto:microgram_editor@mailsnare.net) Requests should include complete mailing address information, **and should confirm that the provided destination is a "safe" (irradiation free) address.** Unless otherwise noted, in cases of competing requests, libraries have precedence. [Note: Postage for offerings from the DEA Office of Forensic Sciences will be covered by the Office.]

- 1) *Analyst* 2002;127(11,12); 2003;128(1).
- 2) *Journal of AOAC International* 1998 - 2002 (some issues missing).
- 3) *Journal of Clinical Psychopharmacology* 1991 - 2002 (many issues missing).
- 4) *Journal of Forensic Sciences* 2000;45(6); 2001;46(2,3,4,5,6); 2002;47(All); 2003;48(2).
- 5) *Journal of Pharmacology and Experimental Therapeutics* 1998 - 2002 (some issues missing).
- 6) *Journal of Toxicology and Clinical Toxicology* 1997 -2002 (some issues missing).

The next offering of journals and textbooks will be in the January 2004 issue of *Microgram Bulletin*. **Subscribers are encouraged to donate surplus or unwanted items or collections; if interested, please consult the *Microgram* website for further instructions.**

\* \* \* \* \*

## THE DEA FY - 2004 STATE AND LOCAL FORENSIC CHEMISTS SEMINAR SCHEDULE

The FY - 2004 schedule for the DEA's State and Local Forensic Chemists Seminar is as follows:

December 8 - 12, 2003  
February 9 - 13, 2004  
April 19 - 23, 2004  
June 14 - 18, 2004  
September 20 - 24, 2004

Note that the school is open only to forensic chemists working for law enforcement agencies, and is intended for chemists who have completed their agency's internal training program and have also been working on the bench for at least one year. There is no tuition charge for this course. The course is held at the AmeriSuites Hotel in Sterling, Virginia (near the Washington/Dulles International Airport). A copy of the application form is appended onto the end of this issue of *Microgram Bulletin*, and should be mailed to the Special Testing and Research Laboratory (Attention: Pam Smith or Jennifer Kerlavage) at: 22624 Dulles Summit Court, Dulles, VA 20166. For additional information, call 703 668-3337.

\* \* \* \* \*

## EMPLOYMENT OPPORTUNITIES

### 1. Houston Police Department

(Third and Final Posting)

**Position:** Crime Laboratory Director

**Location:** City of Houston, Texas

**Salary Range:** \$92,066 - \$100,000 Annually, Dependant on Qualifications

**Application Deadline:** Open Until Filled

**Duties:** Manages the daily operations of the Crime Laboratory, including DNA Analysis, Serology, Toxicology, Drug Identification, Trace evidence analysis, Firearms/Toolmark Examination and evidence registration; will serve as Crime Laboratory Director; hires, supervises and evaluates staff of fifty (50) persons; prepares, administers and monitors division budget; ensures compliance with all federal, state and local laws and regulations regarding physical evidence; oversees development and implementation of standard forensic testing practices and procedures for all sections of Crime Laboratory in accordance with standards set forth by ASCLD-LAB or other appropriate accrediting entity to achieve and maintain laboratory accreditation; plans and implements programs to ensure quality control of laboratory including the generation and storage of laboratory case reports and records; reviews reports and documents concerning evidence analysis and findings; plans directs and oversees the continuous training for all aspects of forensic laboratory services to keep Criminalists up-to-date with all methods of forensic work; works with Investigative Division supervisors to develop protocols for prioritizing laboratory services usage; coordinates division operations with outside agencies and other government agencies; provides physical evidence information to law enforcement agencies, attorneys, judges, the District Attorney's Office and other scientific professionals; reports to an Assistant Chief; performs related duties as required.

**Qualifications:** Educational: Graduation from an accredited college or university with an Advanced Degree and major course of study in Criminalistics, Chemistry or any natural or physical science - or - graduation from an accredited four-year college or university with a major course of study other than one of the described sciences plus fifteen (15) or more years of increasingly complex forensic work experience in a crime laboratory. Experience: Seven (7) years progressively responsible Crime Laboratory experience including two (2) years supervisory experience in an accredited laboratory; or an equivalent combination of education and experience. License: Valid Texas Driver's License and compliance with city's policy on driving (AP 2-2).

**Application Procedures:** Original applications only are accepted and must be received by the Human Resources Department, at 611 Walker, First Floor, Houston, Texas, 77002.

\* \* \* \* \*

### 2. Hamilton County Coroner's Crime Laboratory

(Third and Final Posting)

**Position:** Drug Analyst

**Location:** Cincinnati, Ohio

**Salary Range:** \$33,467.00 (Note: Hamilton County has an excellent retirement and benefits program.)

**Application Deadline:** Open Until Filled

**Duties:** Primary responsibility is to analyze and identify controlled substances using GC-MS, FTIR, and other analytical techniques. Analyst is required to present expert testimony in court. Staff members must comply with safety, quality control, technical and administrative procedures required by accrediting agencies. Analysts also routinely instruct law enforcement officers and other criminal justice professionals on matters relating to forensic science.

**Qualifications:** A BS/BA degree in forensic science or related natural science from an accredited college. Applicants must have completed an internship in a forensic laboratory. A strong background in mass spectrometry, pharmaceutical analysis, or analytical chemistry is desirable. Applicants must possess, or be able to obtain, a valid drivers license.



**Application Procedures:** Submit resume with cover letter to the contact listed below. Individuals selected for interviews are responsible for their own travel expenses.

William L. Dean  
Chief of Forensic Sciences  
Hamilton County Coroner's Crime Laboratory  
3159 Eden Ave.  
Cincinnati, Ohio 45219

Phone: 513-946-8755  
E-mail: [bill.dean@hamilton-co.org](mailto:bill.dean@hamilton-co.org)  
Fax: 513-946-8772  
Website: [www.hamilton-co.org/coroner](http://www.hamilton-co.org/coroner)

\* \* \* \* \*

### **3. Broward County Sheriff's Office (BSO)**

(Second Posting)

**Position:** Crime Laboratory Manager  
**Location:** Fort Lauderdale, Florida  
**Salary Range:** To Be Determined.  
**Application Deadline:** Open Until Filled

**Duties:** This position directs, administers and manages all forensic services functions for the BSO. Critical functions under charge include the Crime Laboratory, Automated Fingerprint Identification System (AFIS), and Latent Identification. Employees in this classification maintain responsibility for the direction, and management of personnel engaged in latent and ten-print identification, audio/video enhancements, quality control/quality assurance, DNA analysis, firearms and tool mark identification, forensic chemistry, questioned documents examination, and trace evidence analysis.

**Qualifications:** A Master's degree in chemistry, biology, or another physical science is required; a Ph.D. is preferred. The position also requires ten years experience that includes advanced forensic chemistry, biology or criminalistics preferably in a large national, state or regional laboratory. Thorough knowledge of DNA processing and American Society of Crime Laboratory Directors (ASCLD) certification required; certification by the American Board of Criminalistics (ABC) preferred. Experience in a managerial capacity with responsibility for administrative aspects of the work strongly desired.

**Application Procedures:** You may view a detailed job description, download an application or apply on-line at: [www.sheriff.org](http://www.sheriff.org). A completed application and accompanying resume will also be accepted by mail: Broward Sheriff's Office, Human Resources Bureau, 2601 W. Broward Blvd., Fort Lauderdale, FL 33312.

EOE M/F/D/V DFWP

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### **4. Ohio University**

(Second Posting)

**Position:** Assistant/Associate Professor of Forensic Chemistry  
**Location:** Athens, Ohio  
**Salary:** [Not Listed]  
**Application Deadline:** Open Until Filled

**Duties:** The Department of Chemistry and Biochemistry invites applications for a tenure-track position as an assistant/associate professor of forensic chemistry. We seek a chemist with postdoctoral or related experience and a research interest in forensic chemistry or related fields (toxicology, DNA typing, homeland security, etc.)

**General Requirements:** The successful applicant will be expected to have a Ph.D. in chemistry or a related field, and to establish a vigorous research program that will attract external funding. Candidates should be prepared to teach general chemistry as well as courses in their area of specialization at both the undergraduate and graduate (M.S. and Ph. D.) levels.

**Application Procedure:** Submit a curriculum vita, a research plan, a statement of teaching philosophy, and arrange to have at least three letters of recommendation sent to: Chair, Search Committee, Department of Chemistry and Biochemistry, Clippinger Laboratories, Ohio University, Athens, OH 45701-2979. Review of applications will begin on September 22, and will continue until the position is filled. Further information on the College of Arts and Sciences can be viewed at <http://www.cas.ohiou.edu>

and on the position and the department at <http://www.chem.ohiou.edu> Minority and female applicants are especially encouraged to apply.

Ohio University is an Affirmative Action/Equal Opportunity employer.

\* \* \* \* \*

**5. Bureau of Alcohol, Tobacco, Firearms and Explosives**

(First Posting)

**Position:** Laboratory Chief

**Location:** Walnut Creek, California (Contra Costa County, San Francisco area)

**Salary:** \$101,351 to \$143,500, dependent on qualifications.

**Application Deadline:** November 25, 2003

**Duties and General Requirements:** The successful applicant should possess a B.S. degree in chemistry or other physical science. The position also requires passage of a background investigation and a top-secret clearance. The applicant will be measured against the following knowledge, skills, and abilities:

- \* Knowledge of the forensic sciences and their application to law enforcement programs. (Prior experience supporting explosives, fire debris, trace evidence and/or firearm enforcement programs is desirable, but not required.)
- \* Knowledge of the theory and practice of management and the ability to manage people, programs and the resources of a laboratory.
- \* Ability to independently identify and solve problems.
- \* Ability to represent ATF at all levels, including internationally; and to work with others to accomplish goals, routinely dealing with representatives from other venues with conflicting priorities.
- \* Ability to communicate effectively in both scientific and managerial arenas, verbally and in writing.

**Application Procedure:** The full vacancy announcement (DPO-A03-027) and application materials may be found at: <http://jsearch.usajobs.opm.gov/summary.asp?OPMControl=110767>

Relocation expenses may be provided.

**NOTE!:** Due to problems in the personnel office, anyone who has previously applied for this position is advised to resubmit their application!

\* \* \* \* \*

## SCIENTIFIC MEETINGS

**1. Title: American Academy of Forensic Sciences - 56th Annual Meeting**

(Third Posting)

**Sponsoring Organization:** American Academy of Forensic Sciences

**Inclusive Dates:** February 16 - 21, 2004

**Location:** Dallas, TX

**Contact Information:** [See website]

**Website:** [\[www.aafs.org\]](http://www.aafs.org)

\* \* \* \* \*

**2. Title: 44th Annual International Drug Conference**

(Third and Final Posting)

**Sponsoring Organization:** International Narcotic Enforcement Officers Association

**Inclusive Dates:** October 19 - 25, 2003

**Location:** Fort Lauderdale, FL (Wyndham Bonaventure Resort and Spa)

**Contact Information:** [None Listed]

**Website:** [None Listed]

\* \* \* \* \*

# Computer Corner

## Instrument Monitoring in a Digital Evidence Laboratory

# #175

by Michael J. Phelan  
DEA Digital Evidence  
Laboratory

Quality assurance is an essential component of every forensic laboratory's daily operation. An important element in Quality Assurance Programs is instrument monitoring.

Historically, the use of various scientific instruments in the forensic/analytical process has resulted in the development and execution of detailed record keeping procedures that formally document instrument configuration and control settings. Many modern forensic laboratory instruments are primarily analog devices interfacing some sensor or detector array to a display or computer. Analog technology is a concern for forensic scientists because the technology has some inherent characteristics which, if improperly managed, can result in erroneous measurements. Examples of potential analog technical concerns include signal level variations, non-linearity in sensor response, and sensor corruption or "memory" resulting from contamination from previous sample analyses. The ability to monitor and document instrument performance over time adds to the credibility of the forensic laboratory's operation and its findings.

Digital evidence laboratories also have to be concerned with their laboratory instrumentation.

However, unlike the analog devices of a drug chemistry or DNA forensic laboratory, digital evidence laboratories are exclusively concerned with binary technologies, in particular computers. Concern for analog related issues in a digital evidence laboratory is of theoretical interest, but it is not a concern at the everyday practical level when conducting digital evidence examinations. Nonetheless, digital evidence laboratory instruments (primarily computers) should be monitored and documented to demonstrate that they are in continuous nominal working order. A basic instrument monitoring program would help defeat technical challenges regarding laboratory findings or examiner conclusions that are based on contesting the accuracy and/or working order of the instrumentation. The implementation costs of an instrument monitoring program are reasonable as long as the scope of monitoring activity is properly managed.

There are several areas that should be considered in developing an instrument monitoring policy for a digital evidence laboratory.

### Base Line Documentation

First, the computer used in an examination needs to be documented at both the

hardware and software levels. The documentation preserves basic information that may be required if it is later discovered that there was a flaw that could have affected the outcome of an examination. At the hardware level, only the principal components need to be enumerated. The documentation should include the make, model, and, serial number of the base examination computer. Internal features such as processor type (for example, Pentium IV), processor speed, memory capacity (Random Access Memory), and internal add-on cards (SCSI, PCMCIA, or IDE-Promise) should be identified.

Similarly, principal software should also be documented. This documentation should include operating system(s), forensic software, anti-virus software, and any other software utilities such as file browsers, or hexadecimal editors, that are used as part of the examination process. Software documentation should include both name and version/release information.

### Upgrades

Second, any major hardware, firmware (ROM/BIOS chips) or software addition, deletion or change to the base examination system, also needs to be recorded. This information

preserves the ability of laboratory management to identify computer system changes that may impact on the examination results or conclusions.

However, the recording of minor software upgrades would likely result in an inordinate amount of examiner time being spent on instrument log upkeep. Digital evidence laboratory management should therefore establish clear policies on what kinds of changes merit being recorded in an instrument log. For example, an upgrade of a new version of software (such as, a change from version 3 to version 4) is usually considered a significant event that should be recorded. In contrast, a software patch (for example, a change from version 4.01 to version 4.02) is a common occurrence in the software business, and should not be recorded. In most laboratories, documenting all such minor changes would become an almost daily task that would very likely reduce examiner productivity. An alternative, less intensive policy would be to selectively record only changes to forensic examination software. Regardless, failure to establish a rational threshold of what constitutes a significant change will likely result in voluminous and time consuming log entries of questionable utility.

#### **Image Restoration**

Third, any restoration of “ghosted” or hard drive duplicates should be documented. Typically, examination hard drives are restored at the beginning of a

new examination, as part of the quality assurance process to insure the integrity of the software. This practice is a useful digital evidence laboratory quality assurance technique.

#### **Failures**

Fourth, any major hardware or software failure should be recorded to identify problems that conceivably could affect examination results. However, a rational threshold is also needed here to identify those failures that should to be documented. Occasional system lock ups (affectionately known as “the blue screen of death”), or the need to reinitialize a specific program or process, should not be considered a major technical failure unless it occurs with a regular frequency (“regular” meaning often enough to significantly impact examiner productivity, or to suggest that the program is somehow corrupted).

#### **Periodic Testing**

Fifth, periodic examination computer system checks should be conducted and documented. Successful passing of the POST test, booting completely to either a GUI interface or command prompt, and executing a normal shut down, all demonstrate that both the computer hardware and operating system software are nominally functional.

#### **Program Scope**

The scope of any instrument monitoring and documentation program needs to balance concerns for thoroughness and laboratory credibility with examiner time expenditure.

DEA has chosen to implement a monthly testing program, record only significant changes, and document all exhibits that are processed on each computer system.

#### **Log Books**

DEA has a bound instrument monitoring log book assigned to every computer workstation in its laboratory that is used to process evidence. This includes specialized portable computers that process evidence on-site and dedicated password cracking computers. Use of a bound log book is a common forensic laboratory technique to demonstrate continuity of hand written data records.

Questions or comments:

E-mail: [mphelan@erols.com](mailto:mphelan@erols.com)

## DEA State and Local Forensic Chemists Seminar Application Form

Name: (PRINT NAME EXACTLY AS IT IS TO APPEAR ON CERTIFICATE)		Title:	
Employer:			
Your Office Mailing Address (include city, state and zipcode)		Business Fax ( ) -	
Business Telephone ( ) -	Length of Service	Date of Application	
EDUCATION		Degree	Major
University			
Please Check Which Techniques or Equipment used in your lab			
	Color Tests		UV
	Column Chromatography		IR
	Microcrystal tests		CE
	Thin Layer Chromatography		GC/MS
	GC		IR
	HPLC		Other(please specify)
Indicate analytical problem(s) nominee would like to have covered:			
Choice of Seminar Dates:			
1st Choice:		2nd Choice:	
Laboratory Chief/Director:			
Printed Name: _____		Signature: _____	
Title: _____		Date: _____	
Phone: _____			

# Microgram

## Bulletin

Published by:

The Drug Enforcement Administration  
Office of Forensic Sciences  
Washington, DC 20537

The U.S. Attorney General has determined that the publication of this periodical is necessary in the transaction of the public business required by the Department of Justice. Information, instructions, and disclaimers are published in the January issues.

VOL. XXXVI, NO. 11

NOVEMBER 2003

- INTELLIGENCE ALERT -

### KETAMINE IN WINE BOTTLES IN EAST LANSING, MICHIGAN

The Michigan State Police Lansing Forensic Laboratory recently received three “Sutter Home” wine bottles each containing approximately 750 milliliters of clear, slightly yellow liquid, suspected *gamma*-hydroxybutyrate (GHB) or *gamma*-butyrolactone (GBL) (see Photo 1). The bottles were seized at a common carrier facility in East Lansing by the Tri-County Metro Narcotics Squad (Michigan State Police Task Force). Analysis of the liquid from one randomly selected bottle by GC/MS and FT-IR, however, indicated not GHB or GBL but rather ketamine HCl. A crude gravimetric quantitation and recrystallization showed that the approximate 750 milliliters in the sampled bottle contained 68.05 grams of ketamine HCl. The other two bottles were not analyzed. This is the first encounter with ketamine solutions in wine bottles by the Laboratory.



Photo 1



**- INTELLIGENCE ALERT -**

**OPIUM “TOOTSIE ROLLS” INSIDE A CASKET FROM THAILAND**

The DEA North Central Laboratory (Chicago, Illinois) recently received 38 rectangular packages consisting of clear packaging tape over a brown leafy substance over flat rolled pieces of plastic containing a black tacky substance, suspected opium (see Photos 2 and 3). The packets (which are locally known as “Tootsie Rolls”) varied in size from 1 x 1 x 1 inch to 1 x 1 x 16 inches, and were originally seized by U.S. Customs Service Inspectors from a casket arriving at the Los Angeles International Airport on a flight from Thailand. The casket was control delivered to an individual in St. Paul, Minnesota by the DEA Minneapolis-St. Paul Resident Office, prior to submission to the Laboratory. Analysis of the material (total net mass 5.960 kilograms, not including wrappings and packaging) by color testing, GC, and MS indicated meconin, codeine, morphine, thebaine, and papaverine, confirming opium. The brown leafy substance was tentatively identified as bamboo leaves. These packets are regularly seized by local law enforcement personnel from Hmong expatriates residing in the upper Midwest; however, this was the first encounter with this smuggling technique by the North Central Laboratory.



**Photo 2**



**Photo 3**

\* \* \* \* \*

**- INTELLIGENCE ALERT -**

**WET COCAINE IN LOTION BOTTLES FROM JAMAICA**

The DEA Mid-Atlantic Laboratory (Largo, Maryland) recently received five different varieties of “lotion” bottles, each containing a plastic bag of pasty white material, suspected wet cocaine (see Photo 4, next page). The exhibits were seized by the United States Customs Service at the Baltimore-Washington International (BWI) Airport. Analysis of the exhibit (total net mass from the bottles was 881.4 grams) by color testing, GC, GC/MS, and FT-IR confirmed 59 percent cocaine hydrochloride. This was the laboratory’s first encounter with this type of smuggling technique.



**Photo 4**

\* \* \* \* \*

**- INTELLIGENCE BRIEF -**

**FENTANYL TABLETS IN POLK COUNTY, FLORIDA**

The Florida Department of Law Enforcement Tampa Crime Laboratory recently received a polydrug submission from the Polk County Sheriff's Office that included two "home-made", light green tablets, allegedly a mixture "kind of like Soma and Valium". The tablets were seized during a probation check from a local drug user who is a so-called "Mikey" (a volunteer "guinea pig" who is willing to "test" (by self-administration) illicit drugs and drug mixtures of virtually any type). Other drugs seized in the same case included methamphetamine residue on charred foil, lorazepam powder and tablet fragments, a methadone tablet, and possible tramadone tablets (the latter were not analyzed, but were tentatively identified by tablet markings). The home-made tablets were unmarked, half-scored on one face, 12 millimeters in diameter, and had an average weight of 600 milligrams (see Photo 5). Preliminary analysis of a chloroform extract of one quarter of a tablet (from a 5% NaHCO<sub>3</sub> solution) by GC/MS suggested fentanyl. Analysis of a methanol extract (1 mL) of the remaining three-fourths of the tablet by GC and GC/MS confirmed fentanyl (quantitation not performed). This is the first time a tablet preparation of fentanyl has been encountered by the Laboratory.

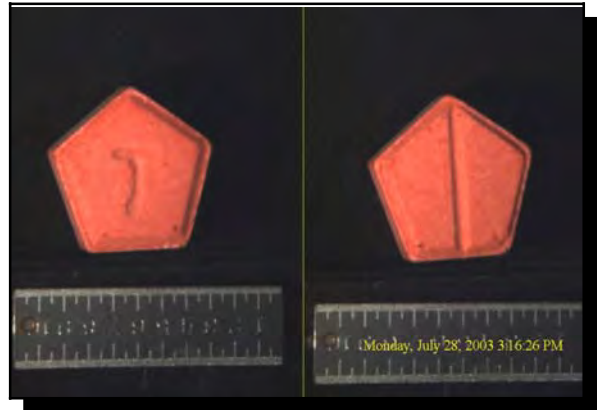


**Photo 5**

**- INTELLIGENCE BRIEF -**

**STANAZOLOL TABLETS, KETAMINE, AND NANDRALONE  
IN NEWARK, CALIFORNIA**

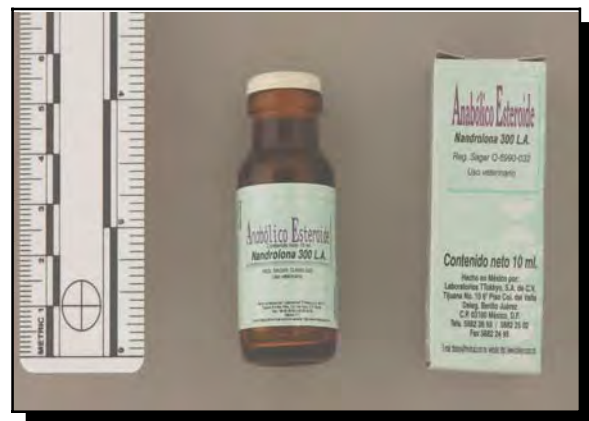
The Alameda County Sheriff's Office Criminalistics Laboratory (San Leandro, California) recently received an interesting polydrug submission consisting of five pentagonal red tablets, suspected ecstasy, and two small cardboard boxes each containing a factory-sealed amber bottle, labelled in Spanish as containing ketamine and nandralone, respectively. The exhibits were seized pursuant to a consent search in Newark, California by the Fremont Police Department (Newark is located a few miles southwest of Fremont). The tablets measured approximately 4 millimeters on each side, and had a "T" logo on one side and a half-score on the other side (see Photo 6). Analysis by GC-MS, however, indicated not MDMA but rather stanozolol (not quantitated). The first box was marked: "...Ttokkyo Centenido Neto: 10 mL...Kettamina 1000...", and the factory-sealed bottle within was similarly marked "...Kettamina 1000..." (see Photo 7). Analysis of the liquid contents by FTIR/ATR and GC-MS confirmed ketamine (not quantitated). The second box was marked: "...Anabolico Esteroides Nandrolona 300 L.A....Contenido neto 10 ml..." and the factory-sealed bottle within was similarly marked: "...Anabolico Esteroides Contenido neto 10 ml. Nandrolona 300 L.A...." (see Photo 8); the fine print on both the box and bottle indicated that this was also a product of Ttokkyo Laboratories. Analysis of the liquid contents by GC-MS confirmed nandrolone decanoate (not quantitated). This is the first time any of these products have been encountered at the Laboratory. As a side note, Ttokkyo Laboratories (a notorious source of ketamine and anabolic steroids, situated in various locales in Mexico) was shut down by local authorities in October 2002 (for additional information, see: <http://www.usdoj.gov/usao/cas/cas21002.1.htm>)



**Photo 6**



**Photo 7**



**Photo 8**

**- INTELLIGENCE BRIEF -**

**GREENISH COLORED MORPHINE POWDERS AT THE U.S.  
PENITENTIARY IN BEAUMONT, TEXAS**

The Jefferson County Regional Crime Laboratory (Beaumont, Texas) recently received two separate submissions of unknown greenish colored powders inside a small plastic bags, total net masses 0.63 grams and 0.83 grams, respectively (photos not taken). The exhibits had been seized by security personnel at the prison, and had been secreted within Muscle Fit and Maxim magazines, respectively, for attempted smuggling to inmates (further details not available). Analysis by spot tests and GC-MS indicated morphine in both exhibits (not quantitated). This was the first submission of greenish colored morphine to the Crime Laboratory.

\* \* \* \* \*

**- INTELLIGENCE BRIEF -**

**“ICE” *l*-METHAMPHETAMINE HCl ON THE WEST COAST**

The DEA Western Laboratory (San Francisco, California) recently received a 3.3 gram sample of clear crystalline material, suspected “ICE” methamphetamine (circumstances of seizure not provided due to ongoing investigation). “ICE” methamphetamine is (by definition) high-purity *d*-methamphetamine hydrochloride; it is usually encountered as large, clear or white-clear crystals, and is typically ingested by smoking. Analysis by Marquis color testing and GC-FID of the N-trifluoroacetyl-L-prolyl derivative, however, indicated not the *d*- isomer but rather 99 percent *l*-methamphetamine hydrochloride. No synthetic route information was developed during the analyses. The



**Photo 9**

laboratory later received a 2670 gram submission from the same case, packaged in six ziplock plastic bags that were further sealed in vacuum-packed, heat-sealed plastic bags. The crystalline material was again clear and the individual crystals were large [see Photo 9]. Analysis indicated that four of the bags contained mixtures of *d*- and *l*-methamphetamine hydrochloride in roughly a 3:1 ratio (favoring the *d*- isomer). The remaining two bags were found to have a similar mixture, but in roughly a 1:10 ratio (favoring the *l*- isomer). Quantitative analysis of a composite sample from all six bags determined the overall purity to be 96 percent. The DEA laboratory system has encountered a number of similar samples over the past two years.

[Editor’s Notes: The literature suggests that *d*-methamphetamine is between five and ten times more potent than the *l*- isomer; however, this does not correspond to differences in efficacy or abuse potential, since abusers can compensate merely by taking more of the *l*- isomer.]



**- INTELLIGENCE BRIEF -**

**ANALYSIS OF THE POPPY CAPSULES FROM THE SIERRA  
NATIONAL FOREST SEIZURE**

[Editor's Preface: The referenced seizure occurred in June 2003, and was reported in detail in the August and September 2003 issues of *Microgram Bulletin*.]

The DEA Special Testing and Research Laboratory (Dulles, Virginia) recently received 18 opium poppy capsules from the June 2003 seizure of the large opium poppy field in the Sierra National Forest, California. [Note: According to the National Forestry Service, there were 40,000 to 50,000 plants in the field, with an average height of three feet, and three to five capsules per plant (see Photo 10). All capsules showed vertical lancing marks on their exteriors (see Photo 11, showing a lanced capsule at the field, bleeding latex).] The capsules (total net mass 15.1 grams) had been thoroughly dried to prevent natural decomposition during transit, and (as a result) several of them had burst open and dispersed seeds into the evidence envelope prior to analysis. The average diameter of the capsules was found to be 19.1 mm and the average height was 20.8 mm. It was not determined whether these capsules represented 'typical' capsules in the field; however, the capsules forwarded to the laboratory were relatively small compared to typical opium poppies from other opium producing regions in the world.

The analysis started by separating the capsules by cutting them off just above the petal scar (i.e., where the flower petals were once attached). The seeds were then removed from the capsules, and the remaining parts of the capsules (mostly hull) were crushed into a uniform mass of small fragments. Analysis of an extract of the hull material by GC/MS (with quantitation by CE ) confirmed 0.4 percent morphine, 0.1 percent codeine, 0.06 percent thebaine, 0.2 percent noscapine, and 0.08 percent papaverine, all calculated at the base. This corresponded to 2 milligrams of morphine base per capsule, or roughly 360 grams of morphine for the entire field. It is unknown whether the field was being cultivated for production of opium gum (for which there is a growing market in the U.S.) or for eventual production of heroin.



**Photo 10**



**Photo 11**

## LAST CALL FOR EMAIL ADDRESSES

The following list (alphabetized by country) represents non-U.S. organizations that have dropped off the *Microgram* subscription e-net. Virtually all of these organizations failed to respond to last year's multiple subscription re-validation requests. Many represent offices or laboratories that closed or moved years or even decades ago. A few provided invalid email addresses, or provided email addresses that have since become invalid.

The Office of Forensic Sciences requests your assistance in tracking down these organizations, and (if they are still interested in receiving *Microgram Bulletin* and *Microgram Journal*) asking them to provide an accurate email address to the *Microgram* Editor. Note that personal names and/or street addresses have been redacted for security reasons; however, the provided information should be adequate to identify those organizations that are still operational. If the office or laboratory has closed or consolidated, or is operational but simply not interested in remaining on the subscription e-net, that information would also be appreciated. All responses should be emailed to the Editor at: [microgram\\_editor@mailsnare.net](mailto:microgram_editor@mailsnare.net)

All organizations for which no response is received will be deleted from the subscription database at the end of this year.

Office 1	Office 2	Misc.	City/Code	Country
* Policia Federal Argentina	Chemical Laboratory		Bahia Blanca 8000	Argentina
* Capital Fed			Yerbal 1095 PB DTO A	Argentina
* Policia Federal Argentina			Neuquen 8300	Argentina
* Policia Federal Argentina			Rosario 2000	Argentina
* Div Laboratorio Quimico			Buenos Aires 1107	Argentina
* Departamento Drogas Peligrosas			Buenos Aires	Argentina
* Camara Federal de Apelaciones	Laboratorio Analitico Pericial		Rosario 2000	Argentina
* Tox Unit/Royal North Shr. Hosp	MacQuarie Hospital Campus		New South Wales	Australia
* National Crime Authority - Perth			West Australia 6000	Australia
* National Institute of Forensic Sciences	R & D Park Centre		Bundoora Vic 3083	Australia
* Division of Analytical Laboratories	Drug Section		Lidcombe NSW 2141	Australia
* Australian Federal Police	Computer Forensics Program			Australia
* Health Department Library			Hobart 7000 Tasmania	Australia
* Der Univ. Innsbruck	Inst. Fuer Gerichtl. Medizin		A-6020 Innsbruck	Austria
* For Sci Lab/Royal	Police Headquarters		Nassau N.P.	Bahamas



Office 1	Office 2	Misc.	City/Code	Country
Bah. Police				
* Ministry of Interior	Crim Invest. Dir/For Sci Lab			Bahrain
* Criminal Investigation Dept			Dhaka 1212	Bangladesh
* Barbados Ministry of Health	Forensic Chemistry Dept			Barbados (West Indies)
* Office of the Attorney General	Forensic Sciences Centre		St. Michael	Barbados (West Indies)
* Expert-Criminalistics Dept	Belarus Min. for Home Affairs		Minsk 220615	Belarus Republic
* Ministry of Internal Affairs	Forensic Centre		Minsk 220615	Belarus Republic
* Gerechtelijke Politie			Antwerp 2018	Belgium
* Institut d'Hygiene et D'epidemiologie			Brussels 1050	Belgium
* Gemeentepolitie			Knokke-Heist 8300	Belgium
* Police Judiciare			Mons 7000	Belgium
* National Forensic Services			Belize City	Belize
* Board on Misuse of Drugs			Hamilton	Bermuda
* Scenes of Crime Office	Police Headquarters		Prospect, Devonshire DV02	Bermuda
* De Advanas Assesor Quimico			La Paz	Bolivia
* Botswana Police Force	Forensic Science Laboratory		Gabarone	Botswana
* Instituto Nationale de Criminalistica Dept	Policia Sul		Brasilia	Brazil
* Inst. of Forensic Science	Ministry of the Interior		Sofia 1000	Bulgaria
* Cambodian Forensic Drug Laboratory	RSO - American Embassy/Phnom Penh		Phnom Penh	Cambodia
* St. Boniface General Hospital	Biochemistry Laboratory		Winnipeg, MB, R2H 2A6	Canada
* BAL Consulting				Canada
* Dept of National Health	Drug Research Lab		Ottawa	Canada
* Royal Canadian Mounted Police	Crime Laboratory		Vancouver, BC V5Z 3L7	Canada
* Pharmc Chem Div/Bur Drug Res	Health Protection Bureau	Tunney's Pasture	Ottawa, ONT K1A 0L2	Canada
* Chief Coroner Ontario			Toronto, ONT M7A 2G9	Canada
* Life Sciences Division		Tunney's Pasture	Ottawa, ONT K1A 0L2	Canada
* Laboratoire de Sci Judiciaires et de Med Legal	Ministere de la Securite Publique - Centre de Documentation		Montreal, Quebec H2K 3S7	Canada
* Maxxam Analytics	Health and Welfare Canada		Mississauga,	Canada

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			ONT L4Z 1P1	
Royal Canadian Mounted Police Forensic Laboratory			Winnipeg, Manitoba R3N 0E7	Canada
* Provincial Toxicology Centre			Port Coquitlam, BC V3C 4J2	Canada
* Laboratorio de Criminalistica de Carabineros de Chile			Santiago	Chile
* Laboratorio de Criminalistica Investigaciones de Chile			Santiago	Chile
* Universidad de Chile, Departamento de Quimica			Santiago	Chile
* The Criminal Police Inst of Shenyang			Shenyang	China
* Ministry of Public Security	Inst of Forensic Sciences		Beijing	China
* Toxi Sec/Beijing Inst of Tong Forensic Sci			Beijing	China
* Dept of Analytical Tox Ministry of Public Security			Beijing	China
* Liaoning Crim For Chem Sci & Tech Res Inst			Shenyang	China
* Lab Div of MJIB			Taipei	Republic of China
* Rech Inst/Security Bur of Pub Security & Tech Pub			Yunnan Province	China
* Forensic Science Laboratory	Municipal Pub Security		Shanghai	China
* Zhongshan Medical College	Dept of Legal Serology		Guangzhou	China
* DAS - Seccion de Laboratorio Forense			Bogota	Colombia
* Instituto Regional de Medicina Legal			Medellin	Colombia
* Dept Admin de Seguridad, Div Lab e. Identifi			Bogota	Colombia
* Div Criminalistica			Bogota	Colombia
* Lab de Estupefacientes			Bogota	Colombia
* Laboratorio Decypol			Medellin	Colombia
Inst Nacional de Medicina Legal y Ciencias Forenses	Coordinadora Laboratorio de Estupefacientes		Bogota	Colombia
* Ministry of Health			Raotonga	Cook islands
* Department of			San Jose	Costa Rica

Office 1	Office 2	Misc.	City/Code	Country
Forensic Science				
* Ministry of Public Health	Narcotic Drug Dept		San Jose	Costa Rica
* Corte Suprema de Justicia	For. Chem Sec/Forensic Sci Lab		San Jose 1003	Costa Rica
Ministry of the Interior	Forensic Institute		Zagreb 10000	Croatia
* Department of Toxicology	Laboratory of Public Health		Heelsunstraat Curacao	Netherlands Antilles
* Ministry of Health	Inspectorate of Narcotic Drugs		12801 Prague 2	Czech Republic
* Dept of Chemistry	Inst of Criminalistics		170 89 Prague	Czech Republic
* Aarhus Universitet	Drug Investigation Section		Skovagervej 2 DK-8240 Risskov	Denmark
University of Copenhagen	Institute of Forensic Medicine, Dept. of Forensic Chem.		Copenhagen	Denmark
* Palacio Policia Nacional	Laboratorio Criminologica		Santo Domingo	Dominican Republic
* Laboratorio Criminalistica			Quito	Ecuador
* Crime Detection and Forensic Science Dept	Natl Ctr for Soc & Crim Res		Cairo	Egypt
* Fiji CID Headquarters			Suva	Fiji Islands
* Prefecture de Police	Direction du Laboratoire de Toxicologie		Paris 2EME	France
* Prefecture de Police	Laboratoire de Police Scientifique		Paris 75001	France
* Laboratoire de Police Scientifique			Marseille Cedex 2	France
* Laboratoire de Police Scientifique			Marseille F-13248	France
* Prefecture de Police	Service Documentation		59650 Villeneuve D'Ascq	France
* Laboratoire de Police Scientifique			F-31021 Toulouse Cedex 02	France
* Ministry of Justice of Georgia	Expertise and Special Research Centre		Tbilisi	Georgia
* Dept of Forensic Chemistry	Chemisches Untersuchungsamt		5800 Hagen 1	Germany
* Landeskriminalamt NW			4000 Dusseldorf 1	Germany
* Landeskriminalamt Baden - Wurttemberg	Landeskriminalamt/KTI-702		70337 Stuttgart	Germany
* Polizei Hamburg - Chemie/toxikologie	Landeskriminalamt Hamburg - IKA 32		22297 Hamburg	Germany
* Westf. Wilhelms-Universitat			48129 Munster	Germany
Landeskriminalamt Rheinland - Pfalz			D-55118 Mainz	Germany
* Landeskriminalamt			65183 Wiesbaden	Germany

Office 1	Office 2	Misc.	City/Code	Country
Hessisches				
* Landeskriminalamt Mecklenburg-Vorpommern	Kriminaltechnisches Institut		0-2711 Rampe II	Germany
* Bundeskriminalamt Wiesbaden			D-65173 Wiesbaden	Germany
* Universitat Tubigen	Pharmazeutisches Institut		Tubigen 1	Germany
* Ghana Police Service	CI Dept/HQs Crime Lab		Accra	Ghana
* Forensic Science Board	Ghana Standards Board		Accra	Ghana
* Lab & Clinical Pathology	Public Health Authority			Gibraltar
* Dept of Legal Toxicology	Univ Med		Thessaloniki	Greece
* Thessaloniki Regional Administration	2nd Chemical Service		Thessaloniki 54625	Greece
* Laboratorio da Policia	Forensic Laboratory	Judiciaria de Macau	Macau	Hong Kong
* Experts Institute			Budapest 62	Hungary
* Committee on pharmaceuticals			172 Seltjarnarnes	Iceland
* State Forensic Sci Laboratory		Manipur, Imphal	Pangei-795114	India
* Tamil Nadu Forensic Sci		Kamarajar Salai Mylapore	Madras	India
* Forensic Science Laboratory		Punjab	Chandigarh	India
* Central Forensic Science Lab	Ramanthapur, Amberpet P.O.	Mha	Hyderabad 500 013	India
* Govern Opium & Alkaloid Works			Chazipur Up	India
* Manipur State Police Forensic Science Lab		Yangdong - 795114	Imphal	India
* Forensic Science Laboratories	Govt of Uttar Pradesh	PO Mahanagar	Lucknow 226 006	India
* State Drugs Control & Research Laboratory	Govt of West Bengal		Calcutta 700 015	India
* Forensic Science Laboratory		Guwahati - 781019	Assam, Kahilpara	India
* Central Revenues Control Lab		Hillside RD/Iari P.O.	New Dehli 12	India
* Forensic Sciences Dept, Narcotics Division		Chepank	Madras 600 005	India
* Tripura State Forensic Sci Lab		Agartala, CID HQs		India
* State Forensic Sci Lab		Govt of Madhya Pradesh	Sagar MP	India
* National Inst of Crim & Forensic Sci			Rohini Dehli 110085	India
* Pusa Institute, Central Control Lab			New Dehli 8	India
Central Forensic Sci Lab	Bur of Invest			India

Office 1	Office 2	Misc.	City/Code	Country
* Govt Opium & Alkaloid Works			Neemuch MP	India
* Forensic Science Lab		Mizoram: Aizawl - 796001	Mizoram	India
Government of Bihar	Forensic Science Laboratory		Bihar	India
* Forensic Science Laboratories		Red Hills, Hyderabad	500 004 A.P.	India
* Indonesian Police Headquarters	Forensic Chem Div, Criminal Police Lab		Djakarta	Indonesia
* Department of Justice, Forensic Science Laboratory	Garda Headquarters	Phoenix Park	Dublin 8	Ireland
National HQ, Sheikh Jarrah	Intelligence Dept.			Israel
National Police Headquarters	Head, Interpol & Intl. Ops			Israel
National Police Headquarters	National Forensic Laboratory; National Police Headquarters			Israel
National HQ, Sheikh Jarrah	Div. of Ident. & Forensic Sci.			Israel
National Police Headquarters	Criminal Intelligence Dept. – Narcotics Control Board			Israel
Agenzia Delle Dogane	Lab Chimico di Roma	Responsabile Reparto Stupefac.	Rome	Italy
Commissario Straordinario	Politiche Antidroga			Italy
Direzione Centrale per i Servizi Antidroga	Centro di Documentazione			Italy
* Gab. Regionale di Pol. Scient.	Sezione Laboratorio Chimico		Firenze Cap. 50129	Italy
* Squadra Mobile Questura			Palermo	Italy
* Inst. Di Medicina Legale	Forensic Toxicology Lab		Terni 05100	Italy
* Seconda Univ. Di Napoli	Cattedra di Chim. Toss. Foren.		Napoli 80138	Italy
* Universita Degli Studi/Siena	Dipart. Di Scienze Medico-Leg.		Siena 53100	Italy
* Univ Degli	Studi Napoli Inst di Menicina		Napoli 5-80131	Italy
* Sottocentro Carabinieri	Investig. Scientifiche, Chemistry Section		Parma 43100	Italy
* Laboratorio Chimico	Centrale d Dogane e II.II		Rome 00153	Italy
* Livorno Chemical Laboratory	Agenzia Delle Dogane		Livorno 57100	Italy
* Laboratorio Chimico Provinciale			Rovigno	Italy
* Joint Research Centre, Environment Institute	Centro Comune di Ricera		Ispra 1-21020	Italy
* Regional Forensic Office for Tuscany			Florence	Italy
* Centre Carrabinieri Invest.			Rome 511	Italy 00165
* Centre of Behav &	UNFDAC Collaborating	Instituto Medicina	Pado 35100	Italy

Office 1	Office 2	Misc.	City/Code	Country
Forensic Tox	Centre	Legale		
Ministry of National Security	Forensic Science Laboratory		Kingston 6	Jamaica
* Hyogo Prefectural Police Dept	Forensic Science Laboratory		Kobe 650-0011	Japan
* Kinki Regional Narcotics Control Office	Chuo-Ku		Osaka City 540-0008	Japan
* Asahikawa Headquarters Crime Laboratory	Hokkaido Police HQ		Hokkaido	Japan
* Hakodate Area Headquarters	Criminal Investigation Lab		Hakodate 040	Japan
* Fukuoka Prefectural Police	Forensic Science Lab		Fukuoka	Japan
* Maritime Safety Agency	Research Center		Tachikama, Tokyo	Japan
* Tokyo Metropolitan Police Department	Section of Analytical Drug	Criminal Investigation Lab	Tokyo	Japan
* Kitamin Prefectural Police Headquarters	Kushiro District Headquarters Hokkaido		Hokkaido 090-8511	Japan
* Hokkaido Prefectural Police Headquarters	Forensic Science Laboratory		Sapporo 060-8520	Japan
* Tokyo Customs	International Intelligence Office	Enforcement Division	Tokyo 135-8615	Japan
* Mie Prefectural Police Headquarters	Forensic Science Laboratory		Tsu Mie 514-8514	Japan
* Ministry of Finance	Central Customs Laboratory	Research & Planning Sect	Chiba-Ken 271-0	Japan
* Kanto-Shinetsu Dist Narc Contr	Ministry of Health and Welfare		Tokyo 153	Japan
* Ministry of Health & Welfare	Narcotic Div, Pharmaceu Bur		Tokyo 100	Japan
* Metropolitan Police Dept	Crime Lab		Tokyo 100	Japan
* Kang-Weon National University	School of Pharmacy	Dept. of Pharmacology	Chuncheon 200	Korea
* Nat'l Inst of Scientific Invest	Forensic Sci Sec		Seoul 122-020	Korea
Narcotics Analysis Division	Drug Evaluation Department	KFDA		Korea
* National Drug Law Enforcement Agency			Lagos	Nigeria
* National Guard of Rep. Latvia			Riga LV-1050	Latvia
* I.C.P.O. Interpol Latvia	National Central Bureau		Riga LV-1009	Latvia
Lebanon Internal Security Forces	Anti-Drug Bureau		Beirut	Lebanon
* Royal Lesotho Mounted Police	Forensic Science Lab		Maseru 100	Lesotho
* Ministry of Internal Affairs	Dept of Forensic Science		Vilnius	Lithuania
* Terengganu Branch	Department of Chemistry		Terengganu	Malaysia



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(Kimia)				
Department of Chemistry Malaysia			Jalan Sultan Azlan Shah	Malaysia
* University of Malta	Medical School, Pathology Department		Gwarda Mangia	Malta
* Police Forensic Sci Laboratory	National Laboratories Complex		Reduit	Mauritius
* Instituto Nacional de Ciencias Penales			Tlalpan 14000	Mexico
* Ministry of Internal Affairs	Criminalistics Center		Kishinev 277012.	Moldova Republic
* Ministry of Science and Technology	National Forensic Science Laboratory		Kathmandu	Nepal
* Ministry of Justice	Forensic Sciences Laboratory		Rijswijk, NL 2288 GD	Netherlands
* Bureau of Pharmaceutical Affairs			Curacao	Netherlands Antilles
* Pub Health Lab	Tox & Pharm Quality Control		Curacao	Netherlands Antilles
* National Poisons Centre	Otago Medical School		Dunedin	New Zealand
* IEHFS	Illicit Drugs and Alcohol Sect		Lower Hutt	New Zealand
* Fed Min of Health	Food and Drug Administration	Central Lab Serv	Oshodi Lagos	Nigeria
* Nigeria Police Forensic Science Laboratory	'D' Department Force CID		Lagos	Nigeria
* National Chem Laboratory			Lagos	Nigeria
* Central Laboratory, Oshodi			Ikeja	Nigeria
* Office National des Produits	Pharmaceut. Et Chimiques		Niamey	Niger
* Norwegian Customs Laboratory			Oslo 0032	Norway
* National Institute of Forensic Toxicology	Statens Rettstoksikologiske Institutt		Oslo 0105	Norway
* National Institutes of Health	New Drug Control Division		Islamabad	Pakistan
* Science Forensic Laboratory	Policia Tecnica Judicial		Panama 1	Panama
* Depart de Narc Minis del Inter			Asuncion	Paraguay
Philippines Public Safety College	National Criminalistics Research & Training Inst		Fort Bonifacio	Philippines
* National Bureau of Investigation			Davao City 8000	Philippines
* Institute of Psychiatry & Neurology	Neurochemistry Department		Warsaw	Poland
* Observatorio Europeu da Drogas da Toxico	Centro de Documentacao		Lisboa 1100	Portugal
* Policia Judiciaria			Porto 4200	Portugal

Office 1	Office 2	Misc.	City/Code	Country
* Ministry of the Interior	Forensic Science Center		Moscow 123060	Russia
* Ministry of Commerce	Quality Control and Insp Dept		Riyadh 11162	Saudi Arabia
* Forensic Lab			Riyadh 11572	Saudi Arabia
* Forensic Labs/Arab Security	Studies & Training Center		Riyadh 11452	Saudi Arabia
* Central Narcotics Bureau			Singapore 169036	Republic of Singapore
Health Sciences Authority	Centre for Forensic Sciences	Narcotics Laboratory	Singapore 169078	Republic of Singapore
National Blood Center	Institute of Science and Forensic Medicine	Dept of Scientific Services	Singapore 169078	Republic of Singapore
* Kriminalisticky a Expertizny Ustav	Policajneho Zboru		Bratislava 831 06	Slovakia
* Ministerio de Defensa	Laboratorio de Referencia/Drugas de Abuso		Madrid 28012	Spain
* Ministerio de Justicia	Instituto Anatomico Forense, Palacio de Justicia		Cartagena	Spain
* Dir Gen de Seguretat Ciutadana	Mossos d'Esquadra Lab Analit.		Barcelona 08018	Spain
* Centro de Farmacia del Aire. Madrid	Laboratorio de Toxicologia		Getafe 28021 (Madrid)	Spain
* De Policia Nacional/Servicio	Central de Estupefacientes		Madrid 2828014	Spain
* Dir Gen de Aduanas	Lab Central de Aduanas		Madrid 3	Spain
* Serv. Centr. de Policia	Laboratorio Quimico		Madrid 28053	Spain
* Ministerio de Justicia	Inst. Nacional de Toxicologia		Madrid 28002	Spain
* Laboratorio. Area de Sanidad			Barcelona 08002	Spain
* Ministerio del Interior	Nacional Sobre Drogas	Delegacion del Gobierno para el Plan	Madrid 28001	Spain
* Catedra de Medicina Leg y Tox	Univ. de Murcia		Murcia	Spain
The Balearic Islands Laboratory of Drugs			The Balearic Islands	Spain
* Ministerio de Sanidad y de Vergara			Madrid 28006	Spain 28006
* National Dangerous Drugs Control Board			Colombo 1	Sri Lanka
* Government Analyst's Dept			Colombo 7	Sri Lanka
* National Dangerous Drugs Control Board	Narcotics Laboratory	National (W.H.O.) Consultant	Rajagiriya	Sri Lanka
* National Dangerous Drugs Control Board	Control Board		Rajagiriya	Sri Lanka
* Forensic Chemistry Lab			St. Thomas	Virgin Islands
* Ministry of Health	Central Laboratory		Paramaribo	Suriname
* Government of Suriname	Pharmaceutical Lab		Paramaribo	Suriname

Office 1	Office 2	Misc.	City/Code	Country
* Nat'l Inst of Forensic Chem	Univ Hosp	Div of Chemical Toxicology	Linkoping 581 85	Sweden
* Statens Kriminaltekniska	Laboratorium		Linkoping S 581 01	Sweden
* Swedish Customs	Analysis Division/Intelligence		Gothenburg S-404 85	Sweden
* Intercantonal Office for Control of Meds.	Swiss FDA		Bern CH3012	Switzerland
* Polizia d. Cantone Ticino	Polizia Scientifica		Bellinzona 6500	Switzerland
* Brigade de Stupeficans	Hotel de Police		1211 Geneva 8	Switzerland
Universite de lausanne	Institut de Police Scientifique et de Criminologie		Ch-1015 lausanne	Switzerland
* Institut fur Rechtsmedizin	Universitat Zurich, Chemisch-Tox. Abteilung		Zurich CH-8057	Switzerland
* University of Bern	Department of Clinical Research	Analytical Toxicology & Pharmacokinetics Unit	Bern CH-3010	Switzerland
* Royal Thai Police Department	Scientific Crime Detection Div		Bangkok 10330	Thailand
* Srinak Harinthwirot Univ	Dept of Chem/Fac of Sci		Bangkok 10110	Thailand
* Thailand Natl Police Dept	Scientific Crime Detect Sect		Bangkok	Thailand
* Bangkok Police Department	Sci Crime Section Laboratory		Bangkok 5	Thailand
* Narcotics Control Board	Phyathai District Board		Bangkok	Thailand
Narcotics Division	Department of Public Health		Nonthaburi 11000	Thailand
* Criminal Police Laboratory			Ankara	Turkey
* State Laboratory, Turkish Rep of N Cyprus	Devlet Laboratuvari.		Northern Cyprus, Lefkosa-Kibris Mersin-10	Turkey
* Ministry of Internal Affairs	Analytical Laboratory		Kampalla	Uganda
Imperial College of Sci Tech	Toxicology Unit	Charing Cross Campus	England	United Kingdom
Liverpool John Moores University	School of Biomolecular Science	Liverpool L3 3AF	England	United Kingdom
University of Central Lancashire	Centre for Forensic Sciences		PR1 2HE England	United Kingdom
* Cuerpo Tecnico de Policia	Div de Toxicologia Forense		Caracas	Venezuela
* Ministerio de Hacienda	Laboratorio de Aduanas		Caracas CSB	Venezuela
* Inst Univ de Policia	Cientifica/Avenida Neveri con Monte Socro/ Auyantepuy/Colina		Caracas	Venezuela
* Nacional Lab y			Caracas	Venezuela

Office 1	Office 2	Misc.	City/Code	Country
Archivo Central				
* Dept Analisis			Caracas	Venezuela
* Lab Toxicologia PTJ	Inst de Med Legal		Caracas	Venezuela
* Dept de Toxicologia	Facultad de Farmacia	Toxicologo Forense	ULA Merida	Venezuela
* National Guard (Venezuela)			Caracas 1020	Venezuela
* Forensic Science Lab			Causeway, Harare	Zimbabwe

\* \* \* \* \*

## SELECTED REFERENCES

[Note: Selected references are a compilation of recent publications of presumed interest to forensic chemists. Unless otherwise stated, all listed citations are published in English. If available, the email address for the primary author is provided as the contact information. Listed mailing address information (which is sometimes cryptic or incomplete) exactly duplicates that provided by the abstracting services.]

1. Coyle HM, Palmbach T, Juliano N, Ladd C, Lee HC. **An overview of DNA methods for the identification and individualisation [sic] of marijuana.** Croatian Medical Journal 2003;44(3):315. [Editor's Notes: Presents a short review of the title topic. Contact: Division of Scientific Services, Connecticut State Forensic Science Laboratory, 278 Colony Street, Meriden, CT 06451.]
2. Jimeno ML, Alkorta I, Cano C, Jagerovic N, Goya P, Elguero J, FocesFoces C. **Fentanyl and its analogue N-(1-phenylpyrazol-3-yl)-N-[2-phenylethyl]-4-piperidyl]propanamide: H-1 and C-13 NMR spectroscopy, X-ray crystallography, and theoretical calculations.** Chemical and Pharmaceutical Bulletin 2003;51(8):929. [Editor's Notes: The oxalate salts and free bases of the title compounds were analyzed by the title techniques. Contact: N Jagerovic, CSIC, Inst Quim Med, Juan Cierva 3, E-28006, Madrid, Spain.]
3. Baeyens WRG, VanderWeken G, Smet E, GarciaCampana AM, Remon JP. **Comparison of morphine and hydromorphone analysis on reversed phase columns with different diameters.** Journal of Pharmaceutical and Biomedical Analysis 2003;32(4-5):913. [Editor's Notes: Presents the analysis of the title compounds by HPLC on 2, 3, and 4 mm i.d. RP columns with UV detection. Contact: WRG Baeyens, State Univ Ghent, Fac Pharmaceut Sci, Dept Pharmaceut Anal, Lab Drug Qual Control, Harelbekestr 72, B-9000, Ghent, Belgium.]
4. Hosztafi S, Noszal B. **Determination of morphine and its derivatives, by means of luminescence analysis.** Acta Pharmaceutica Hungarica 2002;72(3):191. [Editor's Notes: A mini-review of the title topic. Contact: ICN Magyarorszag Rt., 4440 Tiszavasvari, Hung.]
5. Cabovska B, Norman AB, Stalcup AM. **Separation of cocaine stereoisomers by capillary electrophoresis using sulfated cyclodextrins.** Analytical and Bioanalytical Chemistry 2003;376(1):134. [Editor's Notes: The title study is presented. Contact: Department of Chemistry, University of Cincinnati, Cincinnati, OH 45221.]

6. Lewis LD. **Method of disposing of hazardous wastes connected with criminal activity.** US 20030176756 A1 18 Sep 2003, U.S. Pat Appl. Publ. CLASS: ICM: A62D003-00. NCL: 588213000. APPLICATION: US 2002-100325 18 Mar 2002. [Editor's Notes: Presents the use of a portable incinerator (however, only selected waste materials are suitable for destruction). Contact: USA (no further contact information was provided).]
7. Makarov SA, Simonov EA, Makarov VG, Kozlov AS. **Method for determination of narcotic, psychotropic and offensive substances of plant and synthetic origin.** Russ. RU 2,205,385 (Cl. G01N21/78) 27 May 2003, Appl. 2,002,103,845, 18 Feb 2002. [Editor's Notes: Appears to present a narcotics test kit (abstract is not clear). This patent is written in Russian. Contact: Russia (no further contact information was provided).]
8. Hu Y, Ning Z, Liu D. **Determination of pterostilbene in Dragon's Blood by RP-HPLC.** Yaowu Fenxi Zazhi 2002;22(6):428. [Editor's Notes: Presents the title study. This article is written in Chinese. Contact: Medical College of Chinese People's Armed Police Forces, Tianjin 300162, Peop. Rep. China.]

#### **Additional References of Possible Interest:**

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or aqueous solutions. Contact: Laboratorium voor Toxicologie, Universiteit Gent, B-9000 Ghent, Belg.]

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## THE DEA FY - 2004 STATE AND LOCAL FORENSIC CHEMISTS SEMINAR SCHEDULE

The FY - 2004 schedule for the DEA's State and Local Forensic Chemists Seminar is as follows:

December 8 - 12, 2003  
February 9 - 13, 2004  
April 19 - 23, 2004  
June 14 - 18, 2004  
September 20 - 24, 2004

Note that the school is open only to forensic chemists working for law enforcement agencies, and is intended for chemists who have completed their agency's internal training program and have also been working on the bench for at least one year. There is no tuition charge for this course. The course is held at the AmeriSuites Hotel in Sterling, Virginia (near the Washington/Dulles International Airport). A copy of the application form is appended onto the October 2003 issue of *Microgram Bulletin*, and should be mailed to the Special Testing and Research Laboratory (Attention: Pam Smith or Jennifer Kerlavage) at: 22624 Dulles Summit Court, Dulles, VA 20166. For additional information, call 703 668-3337.

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## EMPLOYMENT OPPORTUNITIES

### 1. Broward County Sheriff's Office (BSO)

(Third and Final Posting)

**Position:** Crime Laboratory Manager

**Location:** Fort Lauderdale, Florida

**Salary Range:** To Be Determined.

**Application Deadline:** Open Until Filled

**Duties:** This position directs, administers and manages all forensic services functions for the BSO. Critical functions under charge include the Crime Laboratory, Automated Fingerprint Identification System (AFIS), and Latent Identification. Employees in this classification maintain responsibility for the direction, and management of personnel engaged in latent and ten-print identification, audio/video enhancements, quality control/quality assurance, DNA analysis, firearms and tool mark identification, forensic chemistry, questioned documents examination, and trace evidence analysis.

**Qualifications:** A Master's degree in chemistry, biology, or another physical science is required; a Ph.D. is preferred. The position also requires ten years experience that includes advanced forensic chemistry, biology or criminalistics preferably in a large national, state or regional laboratory. Thorough knowledge of DNA processing and American Society of Crime Laboratory Directors (ASCLD) certification required; certification by the American Board of Criminalistics (ABC) preferred. Experience in a managerial capacity with responsibility for administrative aspects of the work strongly desired.

**Application Procedures:** You may view a detailed job description, download an application or apply on-line at: [www.sheriff.org](http://www.sheriff.org). A completed application and accompanying resume will also be accepted by mail: Broward Sheriff's Office, Human Resources Bureau, 2601 W. Broward Blvd., Fort Lauderdale, FL 33312.

EOE M/F/D/V DFWP

\* \* \* \* \*

## 2. Ohio University

(Third and Final Posting)

**Position:** Assistant/Associate Professor of Forensic Chemistry

**Location:** Athens, Ohio

**Salary:** [Not Listed]

**Application Deadline:** Open Until Filled

**Duties:** The Department of Chemistry and Biochemistry invites applications for a tenure-track position as an assistant/associate professor of forensic chemistry. We seek a chemist with postdoctoral or related experience and a research interest in forensic chemistry or related fields (toxicology, DNA typing, homeland security, etc.)

**General Requirements:** The successful applicant will be expected to have a Ph.D. in chemistry or a related field, and to establish a vigorous research program that will attract external funding. Candidates should be prepared to teach general chemistry as well as courses in their area of specialization at both the undergraduate and graduate (M.S. and Ph. D.) levels.

**Application Procedure:** Submit a curriculum vita, a research plan, a statement of teaching philosophy, and arrange to have at least three letters of recommendation sent to: Chair, Search Committee, Department of Chemistry and Biochemistry, Clippinger Laboratories, Ohio University, Athens, OH 45701-2979. Review of applications will begin on September 22, and will continue until the position is filled. Further information on the College of Arts and Sciences can be viewed at <http://www.cas.ohiou.edu> and on the position and the department at <http://www.chem.ohiou.edu> Minority and female applicants are especially encouraged to apply.

Ohio University is an Affirmative Action/Equal Opportunity employer.

\* \* \* \* \*

## 3. Bureau of Alcohol, Tobacco, Firearms and Explosives

(Second and Final Posting)

**Position:** Laboratory Chief

**Location:** Walnut Creek, California (Contra Costa County, San Francisco area)

**Salary:** \$101,351 to \$143,500, dependent on qualifications.

**Application Deadline:** November 25, 2003

**Duties and General Requirements:** The successful applicant should possess a B.S. degree in chemistry or other physical science. The position also requires passage of a background investigation and a top-secret clearance. The applicant will be measured against the following knowledge, skills, and abilities:

- \* Knowledge of the forensic sciences and their application to law enforcement programs. (Prior experience supporting explosives, fire debris, trace evidence and/or firearm enforcement programs is desirable, but not required.)
- \* Knowledge of the theory and practice of management and the ability to manage people, programs and the resources of a laboratory.
- \* Ability to independently identify and solve problems.
- \* Ability to represent ATF at all levels, including internationally; and to work with others to accomplish goals, routinely dealing with representatives from other venues with conflicting priorities.
- \* Ability to communicate effectively in both scientific and managerial arenas, verbally and in writing.

**Application Procedure:** The full vacancy announcement (DPO-A03-027) and application materials may be found at: <http://jsearch.usajobs.opm.gov/summary.asp?OPMControl=110767>

Relocation expenses may be provided.

**NOTE!:** Due to problems in the personnel office, anyone who has previously applied for this position is advised to resubmit their application!

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# Computer Corner

## Measuring Employee Performance

# #176

by Michael J. Phelan  
DEA Digital Evidence  
Laboratory

Fair and effective measurement of employee performance is an essential function of management. Formal performance measures articulate productivity norms and quality expectations. In forensic laboratories, performance measures are particularly important if there are large examination backlogs (as is typically the case at the present time). Large backlogs foment a crisis attitude, and can easily lead to rushed examinations, cursory reviews, and eventually acceptance of substandard work. Even without such problems, however, there is always the requirement to determine that the examiner's work product is thorough and meets the laboratory's standards with regard to sufficiency of examination.

The subdiscipline of digital evidence, while still relatively new to the forensic science community, shares a strong interest in developing performance criteria that are accurate, easy to implement, and encompass both qualitative and quantitative measures.

### Qualitative Measures

Qualitative measurement of an examiner's digital evidence examination can be assessed on two levels: **Means** and **Ends**. First, the interim tasks (means) that are common to all

examination activities can be reduced to a checklist and monitored. The list should include interim work product assessments that are part of the examiner's case notes. Examples of this type of qualitative measurement could include questions such as: Is the case folder properly organized (yes/no)?; Are the laboratory's standard forms thoroughly completed (yes/no)?; and Are there any factual errors such as incorrect serial numbers, computer/hard drive make and model information, or case number (yes/no)?

DEA has implemented an examination report checklist to document examiner's performance on each report of examination submitted for technical review. The use of clear evaluation criteria that can be answered with a simple yes or no answer has been accepted by the laboratory staff as both reasonable and objective.

However, a full qualitative measure of examiner performance must include an assessment of the end product. Inevitably, this part of the performance measurement process is subjective. Nonetheless, evaluation of an examiner's overall performance needs to be conducted. Ideally, such evaluations are conducted using published standards that

are contained in the laboratory's standard operating procedures or quality assurance manual. Basic ends type evaluation criteria should include factors such as: Thoroughness of the examination effort, an evaluation of the examination effort based upon the scope of the search warrant, and an understanding of the investigative information needs of the case. In most instances, this type of performance measure is best provided by supervisory laboratory management that is/are directly involved with the case management decisions regarding the examiner's level of effort.

### Quantitative Measures

Quantitative measurements in a digital evidence laboratory can be exceedingly complex. The goal of all quantitative measures should be to identify measurement criteria that accurately reflect examiner work effort as well as productivity. The former is a measurement of resource inputs, such as examiner time, while the latter characterizes examination output, such as number of hard drives searched.

Comparison of qualitative measures of examiner performance is possible only when the examination activities are similar. For example, all DEA digital evidence examiners

can be compared to one another because they all perform highly similar activities, i.e., examination of computers seized in drug cases, which are analyzed according to the same laboratory operating procedures. In contrast, however, many state crime laboratories may have their examiners performing a wide variety of digital evidence examinations. In such cases, the scope of examination will significantly differ. For example, child exploitation, fraud, computer hacking, intellectual property theft, and capital crimes such as murder or kidnapping, will each have unique aspects which will require differing amount of examiner time. This is a proverbial “apples and oranges” comparison problem.

DEA has measured its examiner’s time input and exhibit completion rate for the last several years. The average DEA examiner analyzing drug cases utilizes 55 - 57% of their time performing evidence examination work. Another 10% of the average examiner’s time is spent in performing other essential enforcement related activities such providing on-site computer backup support to DEA investigative personnel, or providing court testimony. Collection of laboratory staff work hour activity facilitates assessment of how much work each individual examiner is performing. However, care must be taken to account for important collateral duty assignments that may impact on evidence examination time. Tasks such as method validation or technical training are legitimate

time-consuming activities, especially for senior staffers. Nonetheless, it is relatively straightforward for any individual examiner’s work hour allocation to be assessed by comparing an individual’s performance against the laboratory average.

Examiner output can be measured using the same technique. DEA has found that the average digital evidence exhibit (consisting of a computer hard drive, box of diskettes, zip disks, CDs and alike) takes approximately 37 work hours to examine. This average number has proven to be extremely stable over the last two years despite larger hard drive capacities encountered, because of the concurrent use of faster/better examination hardware and software. Utilizing a laboratory management information system (LIMS) to collect data permits individual examiner data to be compared to the laboratory average. Individual assignments can vary significantly and the amount of work hours expended will vary commensurately. For example, the time needed to process a box of 10 diskettes is minimal compared to the recovery of data from a network server. However, if all assignments are more or less distributed equally over time, then quantitative differences in examiner output can be discerned.

The collection of both qualitative and quantitative data is integral to effective examiner performance measurement. A LIMS must be in place to track

both resource inputs and work product outputs. It is important that comparisons among digital evidence examiners be fairly derived, and that measurable differences in performance be assessed for significance. All assessments must account for examiner collateral duty assignments, experience level, and training, before any substantive conclusions are drawn. Nonetheless, performance is measurable, and is essential for effective examiner assessment, for laboratory workload evaluation, and for budget planning purposes.

Questions or comments?  
e-mail: [mphelan@erols.com](mailto:mphelan@erols.com)

# Microgram

## *Bulletin*

**Published by:**

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Office of Forensic Sciences  
Washington, DC 20537**

**The U.S. Attorney General has determined that the publication of this periodical is necessary in the transaction of the public business required by the Department of Justice. Information, instructions, and disclaimers are published in the January issues.**

**VOL. XXXVI, NO. 12**

**DECEMBER 2003**

**- INTELLIGENCE ALERT -**

**COCAINE IMPREGNATED SILICONE IN BASEBALL CAP PARTS IN PERU**

The DEA Southwest Laboratory (Vista, California) recently received an unusual suspected cocaine smuggling exhibit consisting of apparent fabric cuttings used to make baseball style caps, specifically, 19 off-white pieces that would compose the round part of the hat (total net mass 852 grams), and 18 black nylon covered pieces in a crescent moon shape that would become the visor (see Photo 1 for reconstructed cap). The items were originally seized by the Peruvian National Police (PNP), and had been in a package intended to be mailed from Lima to Hawaii. Analysis by PNP chemists indicated that cocaine was present only in the white pieces. After DEA agents performed a controlled delivery in Hawaii, the evidence was forwarded to the Southwest Laboratory for further analysis. The items had only a faint odor of acetic acid but tested positive for cocaine using the nonacidic cobalt thiocyanate reagent. After several experiments,



**Photo 1**

chloroform was determined to be the best solvent for extraction of the cocaine from the matrix. The “fabric” became transparent after soaking in chloroform for 18 hours, yielding a rubbery material that is suspected to be a silicone caulk type substance (see Photo 2). The material was quantitated to be 47 percent cocaine HCl by weight (equal to 370 grams of pure cocaine HCl).

[Editor’s Notes: According to the suspect, the Peruvian chemist responsible for preparing the material has been in operation for three - four years, has fabricated various other common items using the cocaine-silicone mixture (including wetsuits and suitcase liners), and expects the mixture to become a new method for smuggling drugs into the US and Europe. He also indicated that the items are usually mailed, and are also usually sprayed with pepper spray to deter canines. It is worth noting that curing silicone usually has an odor of acetic acid.]



**Photo 2**

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### **- INTELLIGENCE ALERT -**

### **HEROIN PELLETS INSIDE MEXICAN CHOCOLATE COVERED CANDIES AT FALFURRIAS, TEXAS**

The DEA South Central Laboratory (Dallas, Texas) recently received 71 “Nestle Cocosette Maxi” chocolate bars, each containing three pellets composed of layers of latex and cellophane surrounding a tan colored powdery substance, suspected heroin (total net mass 1913 grams) (see Photo 3; note that the shown bars are approximately seven inches long). The 71 bars were wrapped in four large bundles, using brown tape, and were seized from two men at the U.S. Border Patrol checkpoint near Falfurrias. The candy wrappers were imprinted with Spanish, and are thought to have originated from a manufacturing plant in Mexico (that is, before being diverted and altered for smuggling purposes). Unusually, the pellets appeared to be typical “body-carry” pellets at an intermediate production stage, that is, prior to their immersion in wax. Analysis of the powder by IR, GC/MS, and HPLC confirmed 91 percent heroin hydrochloride. The laboratory has previously received various drug exhibits concealed in chocolate, but this is the first submission that had body-carry pellets coated in chocolate.



**Photo 3**



**- INTELLIGENCE ALERT -**

**COCAINE IN DECORATIVE WOODEN GLOBES FROM HAITI**

The DEA Southeast Laboratory (Miami, Florida) recently received two wooden globes each containing plastic bags containing a white powder, suspected cocaine. The globes, which were about the size of basketballs and were painted with decorative scenes and stylized maps of Haiti (see Photos 4 and 5), were seized by Immigration and Customs Enforcement personnel from a passenger arriving in Fort Lauderdale on a flight from Haiti. Analysis of the powder (total net mass 4272 grams) by GC, GC/MS, and IR confirmed 92 percent cocaine hydrochloride. This is the first submission of this type of smuggling technique to the laboratory.



**Photo 4**



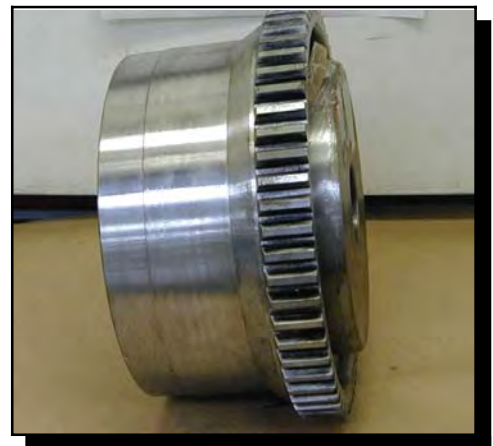
**Photo 5**

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**- INTELLIGENCE ALERT -**

**HEROIN IN A LARGE METAL GEAR FROM BUENOS AIRES, ARGENTINA**

The DEA Northeast Laboratory (New York, New York) recently received a large metal gear containing a tan colored powder, which field tested positive for heroin (see Photo 6; dimensions are approximately 12 x 9 inches). The exhibit was seized by Immigration and Customs Enforcement personnel at the Federal Express Hub in Memphis, Tennessee, and had been shipped from Buenos Aires, Argentina. Analysis of the powder (total net mass 2.47 kilograms) by GC/FID, GC/MS and FTIR confirmed 89 percent heroin hydrochloride. The Northeast Laboratory routinely receives heroin smuggled in various types of containers; however, this is the first submission of this particular type.



**Photo 6**

**- INTELLIGENCE ALERT -**

**CHOCOLATE COVERED MARIJUANA PACKED IN PLASTIC  
AND DRY ICE IN WYOMING**

[From the NDIC *Narcotics Digest Weekly* 2003;2(47):3  
Unclassified, Reprinted with Permission.]

Officials from the Wyoming Highway Patrol (WHP) report that on October 28, 2003, an officer seized 290 pounds of chocolate-covered, suspected high-grade marijuana that was being transported by an Oregon woman traveling from Eugene, Oregon, to Knoxville, Tennessee. According to WHP officials, an officer stopped the woman for speeding as she was driving on Interstate 80 near Cheyenne. The officer became suspicious when the woman provided conflicting information regarding her final destination. The officer asked for permission to search the vehicle, but the woman denied the request. Consequently, the officer detained the vehicle for suspected drug trafficking and requested assistance from the Laramie County Sheriff's Office drug-detection canine unit. The drug-detecting canine alerted to the presence of an illicit drug in the trunk area of the vehicle. Troopers searched the trunk and discovered 290 pounds of chocolate-covered marijuana contained in 11 sealed plastic bags surrounded by dry ice. The 26-year-old female driver was arrested and charged with possession of a controlled substance with intent to distribute.

NDIC Comment: Over the past year, there have been several instances of illicit drug concealment in chocolate. Each of these incidents has been linked to Oregon-based drug traffickers. In December 2002 the Kansas Highway Patrol seized 1,500 pieces of chocolate-covered marijuana that were being transported in a private vehicle from Eugene, Oregon, to markets on the East Coast. In addition, Oregon-based traffickers also transport and distribute chocolate-coated psilocybin mushrooms. From September 2002 to April 2003, law enforcement authorities with the Portland Police Bureau, Drug Enforcement Administration (DEA), and Portland Airport Interagency Narcotics Team (PAINT) seized more than 250 pounds of chocolate-coated psilocybin mushrooms in nine separate incidents. In each of the incidents, the psilocybin mushrooms were being shipped from Oregon to markets throughout the United States via package delivery services.

[Editor's Notes: The phenomenon of chocolate/psilocybin mushroom concoctions has been extensively reported in *Microgram Bulletin* over the past year. In those cases, the chocolates are intended for consumption. In the present case, however, it appears that the combination of chocolate, plastic wrapping, and dry ice is more intended to suppress the odor of the marijuana, thereby reducing the possibility of either human or canine detection. This also appears to be the first ever report in *Microgram* or *Microgram Bulletin* of the use of dry ice as a smuggling aid. For obvious reasons, this technique is extremely risky for the drivers and passengers in the smuggling vehicles.]

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**- INTELLIGENCE BRIEF -**

**MDMA MIMIC TABLETS CONTAINING PCP IN ORLANDO, FLORIDA**

The Florida Department of Law Enforcement (FDLE) Orlando Regional Crime Laboratory recently received a submission of 137.7 grams of blue and 33.2 grams of green tablets, 9 millimeters in diameter, with an elevated cross on one side and single-scored on the reverse (see Photo 7), and 23.3 grams of yellow tablets, 11 millimeters in diameter, with the ying/yang symbol on one side (see Photo 8), all suspected Ecstasy. The numbers of tablets were not determined; however, the blue and green “cross” tablets weighed approximated 270 milligrams each, while the yellow “ying/yang” tablets weighed approximately 360 milligrams each. The exhibits were seized by the Orange County Sheriff’s Office as a result of a buy/bust operation in the Pine Hills area of Orlando. Analysis of the blue and green “cross” tablets by GC/MS, however, indicated not MDMA but rather phencyclidine (PCP). The amount of PCP was not quantitated; however, the green tablets had approximately three times as much PCP as the blue tablets. Analysis of the yellow “ying-yang” tablets by GC/MS indicated an approximate 3:1 mixture of MDA and methamphetamine (exact quantitation not performed) This is the first time this laboratory has seen “cross” logo PCP tablets.



**Photo 7**



**Photo 8**

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**- INTELLIGENCE BRIEF -**

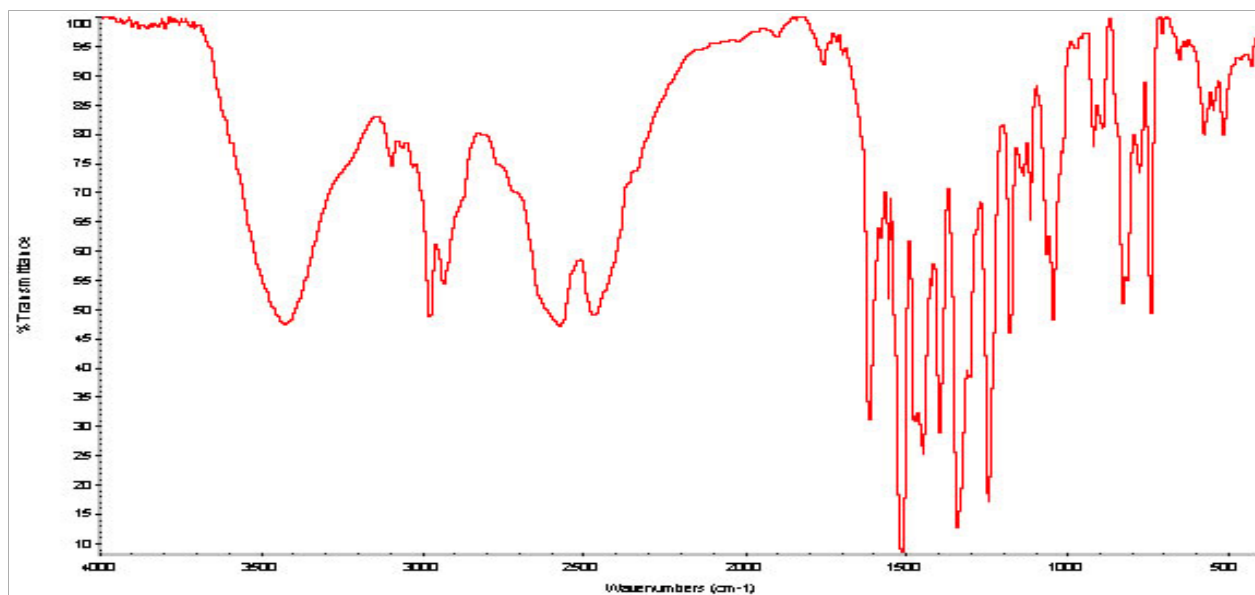
**ETONITAZENE IN BRIGHAM CITY, UTAH**

The Utah State Crime Laboratory (Salt Lake City) recently received an unusual submission of two vials of a yellow crystalline substance, reputed etonitazene (a narcotic analgesic) (see Photo 9). The exhibits were acquired by the Box Elder County Strike Force from a professional chemist working in a commercial laboratory in Brigham City (located in northern Utah). Since this substance has not been previously encountered in Utah, and in fact has rarely been seen in the U.S., the laboratory did not have a standard for comparison. Analysis by GC/MS and FTIR (see spectra, next page) tentatively

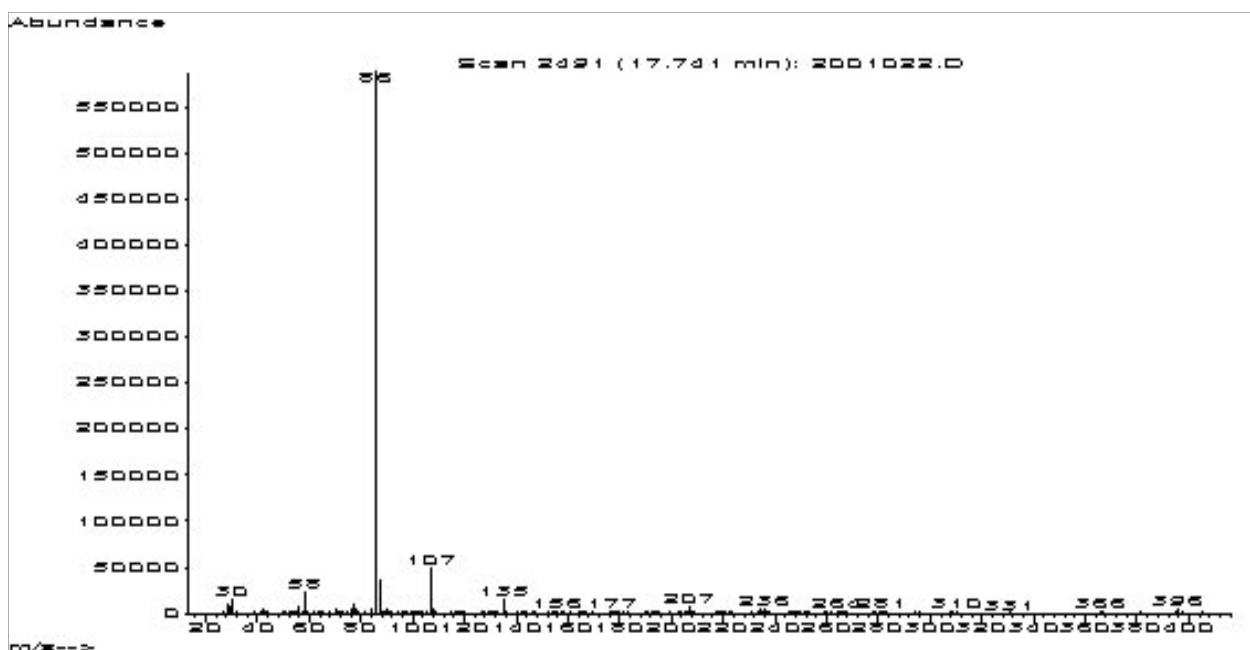


**Photo 9**

identified etonitazene, which led to the arrest of the chemist. The DEA Western Laboratory (San Francisco) later confirmed that the sample was pure etonitazene, based on NMR analysis.



**FTIR Spectra of Etonitazene**



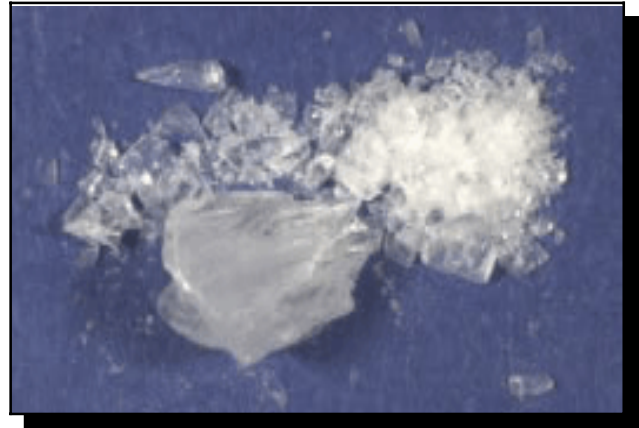
**Mass Spectra of Etonitazene**

[Editor's Notes: Comprehensive analytical data for etonitazene are reported in: Sorokin VI, Ponkratov KV, Drozdov MA. Etonitazene encountered in Moscow. *Microgram* 1999;32(9):239, and also in: Mills and Roberson *Instrumental Data for Drug Analysis*, 2<sup>nd</sup> Ed., Volume 2, pps. 906-907.]

**- INTELLIGENCE BRIEF -**

**METHAMPHETAMINE CUT WITH ALUM IN ROME AND FLORENCE, ITALY**

The Drug Analysis Laboratory of the Servizio Polizia Scientifica in Rome, Italy recently received 12 envelopes containing a total net mass of approximately 100 grams of a translucent crystalline material, suspected "ICE" methamphetamine (see Photo 10). The exhibits were seized by the Anti-Drug Section of the National Police from Filipino citizens in Rome. A similar exhibit was later seized in Florence (circumstances not reported). Analysis by color testing, GC/FID, GC/MS, ion chromatography, and X-ray diffraction (XRD), however, indicated not "ICE" methamphetamine but rather 1.2 to 35 percent methamphetamine cut with alum (potassium aluminum sulfate). This was the laboratory's first encounter with methamphetamine cut with alum.



**Photo 10**

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**- INTELLIGENCE BRIEF -**

**COCAINE/YOHIMBINE AND LSD/AMPHETAMINE MIXTURES  
IN SPAIN**

The National Drugs Laboratory of Spain (Madrid) recently received two unusual exhibits for analysis. The first was a small white bag containing 34 milligrams of an ivory colored powder, suspected cocaine, seized by the Police at a disco in south Madrid. Analysis by GC/MS, however, indicated not only cocaine (45.4 percent) but also yohimbine (not quantitated). The second exhibit consisted of ten and a half stamps, approximately 8 x 8 millimeters square, with an Elvis Presley icon, suspected LSD, seized by the Police in Valladolid (located approximately 150 kilometers north-northwest of Madrid). Analysis by HPLC and GC/MS, however, indicated not only LSD (approximately 21 micrograms per stamp) but also amphetamine (66.7 micrograms per stamp). These are the first submissions of these type mixtures to this laboratory.

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## **Selected Intelligence Brief**

### **COMMON VEHICLE CONCEALMENT METHODS USED IN THE UNITED STATES**

**DEA Intelligence Division  
Office of Strategic Intelligence  
Domestic Strategic Intelligence Unit**

**202/307-8726**

[Unclassified; Reprinted With Permission]

Hidden compartments have been used by smugglers since the beginning of trade and the institution of prohibitions on certain products. Today's drug traffickers are no different from those of the past, except in the methods they employ. Traffickers smuggling their product and/or illegal proceeds into or through the United States use many low- and high-tech methods to conceal both their intent and their contraband from law enforcement authorities. Drug traffickers use various types of vehicles to conceal their contraband ranging from nondescript cars, commercial trucks, vans, and tractor-trailers, to the popular minivans driven by "soccer moms."



How and where drugs are concealed is determined by a variety of factors that include, but are not limited to: the drugs themselves; the size of the vehicle; the final destination of the drugs (i.e., travel distance involved); law enforcement's awareness of current concealment methods; and the imagination of the traffickers and/or the fabricators of the concealed traps themselves. For example, until recently, traffickers moving drugs and currency over long distances within the country preferred the use of the Ford Windstar minivan. Windstars were very popular family vans and could accommodate as many as 10 individual traps. According to current DEA information, traffickers have supplanted their use of Windstars as their use has been compromised and identified by law enforcement.

Possession of hidden compartments or "automotive safes," as they are known in commercial parlance, is not illegal in most states.<sup>1</sup> Hidden compartments are illegal in only a handful of states to include California, Illinois, and Michigan.<sup>2</sup> Penalties for possession of illegal traps vary from seizure of the vehicle in Illinois, to jail or prison time not to exceed 1 year in California. Conversely, trap fabricators in California, "shall be punished by imprisonment in the state prison for 16 months or from 2 to 3 years." There are several companies throughout the United States that are known to install traps and that are recognized by traffickers, one of which is a company called Ultrasmith.<sup>3</sup> However, in addition to such specialty shops, traps are being crafted in auto body shops, machine shops, welding shops, and stereo installation shacks.



In addition to using various concealment methods to smuggle drugs into and throughout the United States, many polydrug smuggling organizations are believed to also be trafficking in human cargo. More sobering, it is not unreasonable to infer that these same routes and methods could be used to smuggle terrorists and their implements of terror into the United States. That the smuggler's art, to include methods and means, has survived generations, lends credence to the notion that traffickers tend to adhere with what works. Nevertheless, drug traffickers are constantly on the alert for indications that law enforcement is becoming aware of their techniques. Routes, conveyances, and concealment methods are continuously updated and subject to change.

Following the tragic events of September 11, 2001, drug traffickers have not significantly altered their use of concealment methods and use of traps. However, traffickers have made allowances for increased airport security by scaling back their routing of drugs and currency through airports and have instead redirected drug shipments over the nation's highways and byways.

Traffickers' use of traps as a vehicle concealment method is based on the type of load and the distance of travel. These traps can generally be placed into three broad categories: small, medium, and large.

### **Small Traps**

Intermediate and low-level suppliers use small traps to move small amounts of drugs, usually less than 3 kilograms, short distances; that is, across cities or between nearby urban areas such as New York City and Newark, New Jersey. Traps of this size are also used to facilitate local deliveries. For example, the DEA New York Field Division (NYFD) has identified several groups of Dominican traffickers using Lincoln Towncars with livery tags to deliver drug orders to customers who have placed orders from bars and hotels.



**Trap found in an automobile  
airbag space**

Small traps are generally the most technologically sophisticated, with many requiring complex sequences of dashboard buttons and switches manipulated to access or close concealed compartments. Some compartment doors are operated by electrically-operated pistons; others may have mechanical or



**Floor-plate trap in the closed and open positions**

magnetic latches that are released only when the proper sequence is entered or after a small magnet has been passed over them. Other small traps may consist of manually and electrically operated drawers fabricated into and/or under seats; in both center- and overhead-consoles; and behind air-conditioning vents. A number of inconspicuous original equipment manufacture traps are being identified: natural voids under center-consoles; under change mats; and in or under areas used to store audio tapes and compact disks.

A difficulty in identifying these traps is that they often exhibit no signs of alteration and, therefore, may be overlooked by law enforcement officers during the course of a routine search at the scene of a traffic stop. Many traps are only found upon a destructive search or by technical personnel. Which traps are employed and where they can be found is dependent upon the type of vehicle; however, a common small trap location is in the passenger airbag space, usually located above the glove box or on top of the dashboard. The size of the vehicle is not necessarily representative of the size of the trap being employed; however, larger vehicles have more natural voids, thereby allowing traffickers to employ more traps than in smaller vehicles.

Small traps are also used to conceal weapons. When the traps are used for this purpose, they are usually easily accessible and within reach of the driver or, in the case of someone being chauffeured, within easy reach of that person whether they are in the front or back seat. There have been numerous reported instances where law enforcement personnel have witnessed suspects entering vehicles with weapons in their hands, but have been unable to locate the weapons after the vehicle was stopped. Traps used for weapons concealment may be found in the passenger airbag compartment; in the doors; in seatbacks; in center-consoles; and under the carpeting at the driver's feet.

### **Medium Traps**

Traffickers employing medium-sized traps typically use them to transport and deliver 25 to 50 kilogram loads over intermediate distances, that is, intrastate deliveries. They may also be used to convey drugs and other contraband over longer distances encompassing hundreds of miles and crossing multiple state lines. For example, medium-sized traps may be employed to move drugs from Tucson, Arizona to Chicago, Illinois.

Medium-sized traps are generally less technically sophisticated than small traps, but may be very innovative in their placement and concealment. As the loads are being transported over relatively long distances, the drugs may be dispersed throughout various compartments in the vehicle which are inaccessible to the vehicle's occupants. In fact, the occupants may be unaware of the location or amount of the drugs they are delivering.

Medium-sized traps often make use of natural voids found behind the dashboard; between body panels and the frame of the vehicle; the frame of the vehicle itself; inside doors; inside the fuel tank(s); throughout the engine compartment; and inside vehicle batteries. The location and size of these compartments is restricted only by the size of the vehicle and the fabricator's imagination.



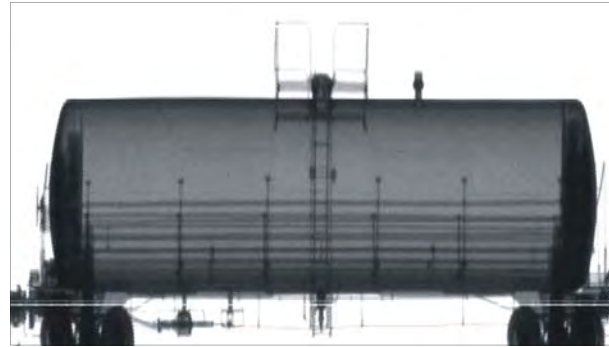
**Welded compartment discovered in the rear of a minivan**

## Large Traps

Large-scale traffickers along the Southwest Border frequently use tractor-trailers and refrigerated utility trailers to transport loads through the ports-of-entry (POEs). This is probably the most secure and efficient way to transport large amounts of marijuana, which can be concealed within loads of legitimate agricultural products. Large traps are most often used to convey large quantities, hundreds of pounds to metric tons, of drugs and currency across borders and long distances. These traps are generally the least technically sophisticated and may consist of false compartments welded into, onto, or alongside standard vehicle equipment. For example, in April 2003, Bureau of Customs and Border Protection (CBP) agents located 981 pounds of marijuana secreted in a crane counterweight being transported through the checkpoint near Falfurrias, Texas. The trap was located after a drug-detection canine alert, and because the traffickers had over-applied the “make-up” grease and dirt used to hide the weld marks and fresh paint. Traffickers employing large traps may use any type of vehicle, depending upon the amount of drugs being transported and the destination. Large traps have been found in, but are not limited to, the tractors and trailers of over-the-road semis; busses; railroad box- and tank-cars; and sport utility vehicles (SUVs). For example, on February 8, 2003, United States Customs Service (USCS) officers searched a railroad tank-car entering the United States. Gamma-ray scanning revealed secret compartments at both ends of the car. Further inspection of the car resulted in the seizure of 173 packages of marijuana, totaling 2,551 pounds. Investigative follow-up resulted in the identification of another rail car—which had already crossed into the United States—in transit to New Jersey. DEA special agents in Newark intercepted the second rail car and discovered another 1,741 pounds of marijuana concealed in secret compartments.

## Trends

In the Spring of 2002, USCS agents discovered an interesting method of concealment at the Deconcini POE in Nogales, Arizona, where 14.7 pounds of marijuana were seized from a Mexican-registered Dodge Caravan. The packages of marijuana were wrapped in cotton and placed in a sealed rectangular mold



**Tank car with false compartments on ends**



**Marijuana stored in hidden compartment in floor of a semi-trailer**



**Marijuana seizure found in a crane counterweight**

made of a honey and wax mixture. The mold was then placed in a hidden compartment located in the dash of the vehicle. The marijuana was not detectable by USCS drug-detection canines. This concealment method has allegedly been used at other POEs in Arizona, as well as in California. The drivers are reportedly Mexican citizens residing in Tijuana. Intelligence information indicates that, although this concealment method is usually employed by cocaine smugglers, test runs are being conducted with small loads of marijuana.<sup>4</sup>

The Nogales Resident Office has reported that the use of SUVs to transport drugs had become extremely popular during Fiscal Year 2002. Recovered SUVs have been found to contain sophisticated built-in compartments, and appear to be replacing both tractor-trailers and personally owned sedans as conveyance vehicles in the Nogales area.<sup>5</sup>

According to a Special Agent in the DEA NYFD, Unified Intelligence Group (UIG), “As trafficking groups move. . . their tried and trusted concealment techniques move with them.” Concealment techniques identified with Dominican trafficking groups in the Northeast are now popping up in the Midwestern and Western States as these groups migrate westward. Likewise, concealment techniques and vehicles commonly associated with Mexican trafficking groups throughout the Southwest and Midwest are now being encountered in Eastern States.

## **Conclusions**

Traffickers’ use of traps will continue. Additionally, they will continue to adapt and use different vehicles, more sophisticated traps, and concealment locations in an attempt to change their profiles and in response to law enforcement’s identification and targeting of favorite vehicles. Consumer interest in large four-wheel-drive and other off-road vehicles, increases trafficker access to these vehicles. The size and ubiquitous presence of modern SUVs afford traffickers the option of scaling down their use of commercial trucks—which are subject to greater scrutiny on America’s highways. New and even more sophisticated traps are virtually assured as various associated technologies, such as miniaturization, are refined. The miniaturization of trap components, such as electric motors, actuators, and hydraulic pistons, will allow fabricators to place traps in areas previously denied due to size constraints.

Law enforcement personnel must continue to be knowledgeable of vehicle concealment methods and techniques used by traffickers to combat their attempts to conceal drugs and their illegal proceeds. In addition, they must be as imaginative in their searches as the traffickers and fabricators are in their placement of the traps. Small traps, commonly used for drug deliveries or weapons storage, are generally within easy access of the driver or chauffeured passengers. Medium traps often make use of natural voids in vehicles or convoluted compartments, and the contraband may be inaccessible to the occupants of the vehicle. In large traps, the contraband is generally secreted in compartments or additions fabricated into or welded onto the smuggler’s conveyance of choice.

This brief is not intended to be an all-inclusive guide to concealed traps in vehicles, but rather a general source of information for those working in offices not located along the Southwest border, nor along major interstate routes where Operation CONVOY or PIPELINE stops are frequently conducted. The authoritative sources for information on commonly encountered vehicular concealment methods are the Domestic and Operation PIPELINE units at the El Paso Intelligence Center and the UIG.

1. Although concealed traps may be referred to as “automotive safes,” there are legitimate businesses which manufacture and advertise security safes, ostensibly used to secure valuables



and weapons in vehicles, and refer to them as automotive safes. These differ from traps in that they are usually mini-safes with combination or key locks which are permanently installed in vehicles, but are not usually concealed. Some of these safes may feature an additional “lock and carry” feature where they can be secured to a permanently-installed “docking device” located in the vehicle while the vehicle is occupied, but removed when the vehicle is left unattended.

2. Michigan state law does not specifically prohibit automotive safes or hidden compartments, but does outlaw them under the definition of drug paraphernalia, “A device commonly known as an automotive safe, that is specifically designed to carry and conceal a controlled substance in an automobile, includes, but is not limited to a can used for brake fluid, oil, or carburetor cleaner which contains a compartment for carrying and concealing controlled substances.”
3. Ultrasmith is a New York-based company that specializes in automotive customization to include, but not limited to, luxury interior upgrades, performance enhancements, and vehicle armoring.
4. Source information derived from DEA Phoenix Field Division 3rd quarter, FY 2002, Quarterly Trends in Trafficking Report.
5. Source information derived from DEA Phoenix Field Division 3rd quarter, FY 2002, Quarterly Trends in Trafficking Report.

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[Note: Selected references are a compilation of recent publications of presumed interest to forensic chemists. Unless otherwise stated, all listed citations are published in English. If available, the email address for the primary author is provided as the contact information. Listed mailing address information (which is sometimes cryptic or incomplete) exactly duplicates that provided by the abstracting services.]

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## THE DEA FY - 2004 STATE AND LOCAL FORENSIC CHEMISTS SEMINAR SCHEDULE

The remaining FY - 2004 schedule for the DEA's State and Local Forensic Chemists Seminar is as follows:

February 9 - 13, 2004  
April 19 - 23, 2004  
June 14 - 18, 2004  
September 20 - 24, 2004

Note that the school is open only to forensic chemists working for law enforcement agencies, and is intended for chemists who have completed their agency's internal training program and have also been working on the bench for at least one year. There is no tuition charge for this course. The course is held at the AmeriSuites Hotel in Sterling, Virginia (near the Washington/Dulles International Airport). A copy of the application form is appended onto the October 2003 issue of *Microgram Bulletin*, and should be mailed to the Special Testing and Research Laboratory (Attention: Pam Smith or Jennifer Kerlavage) at: 22624 Dulles Summit Court, Dulles, VA 20166. For additional information, call 703 668-3337.

\* \* \* \* \*

## EMPLOYMENT OPPORTUNITIES

### 1. Virginia Department of Criminal Justice Services

(First Posting)

**Position:** Forensic Scientist II (Controlled Substance Examiners) (Two Positions)

**Location:** Division of Forensic Science, Eastern Laboratory, Norfolk, VA

**Salary:** \$39,901 - \$65,540

**Application Deadline:** Open Until Filled

The Department of Criminal Justice Services is seeking two qualified individuals to perform forensic chemical analyses of suspected controlled substances in the Division of Forensic Science, Eastern Laboratory.

**Duties:** Incumbents will: 1) Use current state-of-the-art methodologies and instrumentation to analyze controlled substances; 2) Prepare Certificates of Analyses on findings for use by the criminal justice system; and 3) Testify in court as a qualified expert for the Commonwealth at criminal proceedings as to the results of laboratory findings. Position requires occasional overnight travel. Employee will provide own transportation as required.

**General Requirements:** Knowledge of basic theoretical principles and applications of the instrumentation and methodologies used to analyze controlled substances required. Knowledge of laboratory safety procedures; quality assurance/quality control and laboratory practices; instrumental analysis (GC, GC/MS, FTIR, UV) and experience in forensic drug analysis required. Successful completion of a documented training program and/or demonstration of competency is required. Experience presenting testimony in a court of law, as an expert witness is preferred. Must be able to analyze data, develop sound conclusions, maintain accurate records, and analyze, and solve technical problems. Ability to communicate effectively orally and in writing required. A baccalaureate degree in chemistry or other related science with sufficient chemistry courses is required; graduate degree is preferred. Valid driver's license and/or other means of reliable transportation required.

**Application Procedure:** Applicants must submit a state application (#10-012). Applications may be mailed to the Department of Criminal Justice Services, 805 East Broad Street, 10th Floor, Richmond, VA 23219, ATTN: Human Resource Office; emailed to [gcolburn@dcjs.state.va.us](mailto:gcolburn@dcjs.state.va.us) or faxed to 804-786-6484. State application forms may be obtained by calling (804) 786-4246 or by downloading the form from the employment section of the DCJS web page at [www.dcjs.org](http://www.dcjs.org). For assistance, call Gene Colburn at (804) 786-6925.

Notes: Selected candidates must provide a DNA sample via a buccal swab (saliva sample), be fingerprinted and pass a security background check. Equal Opportunity Employer.

# Computer Corner

## Digital Evidence - Growing Pains

# #177

by Michael J. Phelan  
DEA Digital Evidence  
Laboratory

The recognition in 2003 of digital evidence as a forensic science discipline by the American Society of Crime Laboratory Directors (ASCLD) was a milestone that symbolized the growing importance of digital evidence analysis to the criminal justice system.

The formal recognition has had several consequences. First, ASCLD recognition served notice to the forensic science community that computer forensics, digital audio and digital image/video enhancements are recognized sub-disciplines which must meet ASCLD inspection criteria, if offered as a service by an already accredited ASCLD forensic laboratory or laboratory system. ASCLD/Lab, the inspection arm of ASCLD, held its first digital evidence inspector training class in May 2003. One US crime laboratory has already undergone a digital evidence inspection, and several more will undergo accreditation inspections in 2004, including DEA's Digital Evidence Laboratory.

Second, the technical/subject matter expert community has begun to expand beyond simple technical exchanges on digital evidence tools or examiner training. Organizations such as the Scientific Working Group on Digital Evidence (SWGDE), the

International Organization of Computer Examiners (IOCE), and the International Association of Computer Investigative Specialists (IACIS), are all currently engaged in developing a complementary infrastructure for the digital evidence discipline, including basic examiner qualifications, individual certification, proficiency testing, and digital laboratory design recommendations.

Third, legislatures are beginning to mandate that law enforcement organizations ensure that digital evidence examinations are performed by qualified examiners. For example, the Texas legislature recently passed a law requiring that digital evidence examinations be conducted by accredited laboratories. The momentum to ensure that basic forensic science methods and principles are applied to digital evidence is slowly growing.

While much has been accomplished over the last few years, there remain a number of areas that are largely undefined. Areas of open discussion within the digital evidence community include: instrument calibration testing, methods validation, the proper use of controls in a digital examination, evidence handling/storage criteria, proficiency testing, and

instrument log book criteria.

### Instrument Calibration

The purpose of an instrument calibration test is to document that the examination device (computer, logic analyzer, etc.) is in working order. Usually, instruments are tested periodically (daily, weekly, or monthly), and also before the start of an examination of evidence. In the digital evidence field, the testing of an instrument has been interpreted to include the passing of a computer POST test, ability to copy and calculate a digital signature (hash) for a piece of external media (where the hash of the data has been previously determined), and recover/display various file types that are commonly encountered as evidence (such as images, spreadsheets, or e-mails). However, the problem for the digital evidence manager is to develop a calibration test that is substantively meaningful, but does not require an unreasonable amount of time to perform.

### Methods Validation

Methods validation is another problematic area that inevitably pits scope of effort against examiner time resources. Methods validation studies involving both examination software and key examination hardware devices (such as hard drive write blockers and

duplicators) can be a very extensive undertaking. Although the National Institute of Standards has validated some disk copying software (e.g., Encase Version 3 imager, Safeback Version 2.18, and the Unix dd command), each digital laboratory still needs to validate the software that it uses. Defining the robustness of the testing protocol, and determining what constitutes a software change that requires re-testing, are two major areas of current debate. However, there is almost universal agreement that any proposed methods validation program must be succinct and easily administered if it is to be effective, because any new piece of hardware or software must be tested **prior** to its use in the examination of evidence (and upgrades occur routinely in digital evidence laboratories).

### **Controls**

The use of controls in a digital evidence examination is a standard practice to ensure that the results achieved are real and (where applicable) quantitatively measurable. A control is essentially a test of the examination hardware and software to demonstrate that no spurious data is added to the evidence or misinterpreted (such as e-mail not found, or image files not recognized as pictures). A control in a digital evidence examination that tests for the introduction of spurious data is known as a negative control. A test to determine if the examination software recognizes data in the appropriate format is known as a positive control.

This is not as trivial as it sounds.

Technically, there is no such thing as an absolute negative control or “blank” in digital evidence, since all digital media that is formatted or initialized must contain some binary pattern of information. For example, a standard floppy diskette right out of the box and just formatted by the Windows operating system contains binary data in the Master Boot Record, File Allocation Table and Data storage areas. Therefore, the easiest solution for a “negative control” test is to generate media that contains a known (and finite) test pattern to determine (by select keyword searching) that no data artifacts are being introduced by the examination software or hardware.

A positive control can consist of finding a previously documented pattern of data or file type (such as ASCII text, images, documents, spreadsheets, or e-mails) in order to demonstrate that the examination system is in working order.

Controls should be implemented in parallel to the examination process. In the digital evidence field, examination controls are tested either before the examination is started or after the examination has been completed. The pressing issue within the digital evidence community involves assessing what form of test media constitutes an adequate control, since mounting and testing an entire hard drive (as a control) would take an inordinate amount of time to handle and exhaustively search.

### **Evidence Storage**

Another area of debate focuses on digital evidence storage. In order to secure evidence in the custody of a forensic laboratory, management must take the necessary steps to protect the object from damage, deleterious change, and unauthorized access. Accordingly, digital evidence needs to be insulated as well as possible from physical damage and electrical shock. Anti-static bubble wrap and Styrofoam popcorn are two common means to insulate evidence from both jarring and static electricity. Preventing unauthorized access has historically involved extensive use of evidence tape or evidence stickers, or sealing an object in a box or bag. Recently, large Mylar bags capable of storing a full tower computer have become available.

However, there is still significant debate within the community on what storage conditions are necessary. For example, is temperature or humidity a concern? Should fire suppression technology rely on water sprinklers in an evidence storage area? What steps are prudent when dealing with battery powered objects? Are radio frequency (RF) Laboratory Evidence Management Systems (LEMS) systems compatible with digital evidence storage best practices? (that is, does RF emitted energy endanger consumer electronic memory storage devices?)

### **External Proficiency Test**

The development of digital evidence proficiency testing programs is still in its infancy. ASCLD has not yet recognized

any organization as an approved digital evidence external proficiency test provider, and SWGDE has yet to define and approve the elements of a generic proficiency test. Many laboratories have developed internal proficiency testing; however, the depth and breadth of those tests vary very widely.

The most salient problem involves the diversity of what constitutes a digital evidence examination. For example, a civil litigation digital examiner might be concerned only with the identification of e-mail communication containing specific key words such as “tobacco”, “asbestos”, or “carcinogen”. A criminal digital evidence examiner might be similarly limited to the recovery of potential child exploitation images, pharmacy prescription information, financial data for a specific period of time, or e-mail belonging to only one person. Such limitations may be a result of the search warrant’s scope or the laboratory’s standard operating procedure defining sufficiency of examination. However, other criminal examinations may require much more in-depth data-mining to achieve the investigation’s objectives. Such “connect the dot” type examinations are much more typical of many drug, conspiracy, and espionage cases. The problem that arises with designing an external proficiency test for the entire community becomes an issue of proper scope. Can one external proficiency test serve all practitioners? The answer would clearly seem to be “No”. Therefore, can a multi-tier

system be devised that properly tests any of the varied programs in the digital evidence constellation, each in accordance with its typical duties?

### **Instrument Logbooks**

Instrument logbooks are another source of discussion. The need to document the current state of any instrument (including computers) that process evidence has been a long-standing requirement in forensic science. The issue confronting digital evidence examiners is (again) scope. The need to record existing and new examination software and hardware is clear. However, does every minor update or software patch need to be documented? What about transient instrument failures? Does every instance of a computer “hang”, affectionately known as the “blue screen of death”, merit recording in the instrument log? A laboratory’s policy should reflect balance between level of effort (examiner time) and information needed to identify serious equipment or software problems, or potential issues concerning examination integrity.

The maturing of the digital evidence field will take some time, as the core principles of forensic science are applied. Eighteen months from now (after several digital evidence laboratories have undergone their ASCLD inspections), many of these questions will have been answered. In the interim, forensic science managers must address the issues through their internal quality assurance programs.

The challenge for all digital evidence managers, supervisors, unit chiefs, and police chiefs is: If not you then who? If not now then when? To ignore these issues and wait until some future date, will possibly encourage the courts or legislatures to externally regulate the digital evidence discipline.

Questions or comments?

E-mail: [mphelan@erols.com](mailto:mphelan@erols.com)

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# Microgram

## *Bulletin*

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**VOL. XXXVII, NO. 1**

**JANUARY 2004**

### **Roger Fuelster Reaches 40-Year Mark in Distinguished Federal Career**

On Tuesday, November 25th, Senior Forensic Chemist Roger G. Fuelster of the DEA North Central Laboratory (Chicago, Illinois) was awarded a 40-Year Award Pin at DEA Headquarters for his length of Government service. Roger is a 1963 graduate of Valparaiso University, where he earned his B.S. degree in Chemistry. Two weeks later, he began his Federal career as a chemist with the Food and Drug Administration (FDA) at their Chicago District Laboratory. Over the next five years, he specialized in drug analysis, particularly illicit drugs being encountered in the then rapidly growing "tune-in/turn-on" counterculture. In 1968, Roger



transferred to the Department of Justice, Bureau of Narcotics and Dangerous Drugs (BNDD) at their newly opened Chicago Regional Laboratory, where he became heavily involved in training chemists for the entire laboratory system. In 1973, BNDD was merged into the Drug Enforcement Administration and the Chicago Regional Laboratory became the North Central Laboratory. Roger is also a charter (near-30 year) member of the Midwestern Association of Forensic Scientists (MAFS), which is one of the largest of the regional forensic scientist associations. He has been recognized by both the DEA and by prosecutors he has worked with

throughout his career. The Office of Forensic Sciences salutes Roger for reaching this extraordinary career milestone.

\* \* \* \* \*

**- INTELLIGENCE ALERT -**

**COCAINE IN TINNED CANDLES IN GRAND JUNCTION, COLORADO**

The Grand Junction Police Department Laboratory (Grand Junction, Colorado) recently received eight metal tins, each containing a colored, scented candle, suspected of containing cocaine (see Photo 1; dimensions are approximately 5.7 x 5.7 x 3.9, 8.1 x 8.1 x 3.9, and 6.3 x 3.9 x 2.9 inches). The candles were seized by the Grand Junction Police Department from a suitcase in the luggage compartment of a bus at the local Greyhound bus station. Dissecting the candles revealed plastic wrapped packages within the wax shell. Interestingly, the color of the plastic wrap corresponded to the color of the wax (see Photo 2). Presumptive analysis of the powder (total net mass not determined) by the Scott's reagent confirmed cocaine (quantitation not performed). This is the first time the Laboratory has seen cocaine packaged in this manner.

[Editor's Note: A similar seizure (made in Norfolk, Virginia) was reported in the September 2003 issue of *Microgram Bulletin*.]



**Photo 1**



**Photo 2**

\* \* \* \* \*

**- INTELLIGENCE ALERT -**

**METHAMPHETAMINE UNDER STAMPS ON LETTERS MAILED TO  
THE ERIE COUNTY PRISON (PENNSYLVANIA)**

The Pennsylvania State Police Erie Regional Laboratory (Erie, Pennsylvania) recently received several letters suspected to have a controlled substance in the envelope glue or laced into the enclosed papers. The letters were submitted by the Pennsylvania Attorney General's Office, and

had been originally seized at the Erie County Prison (photos not available). Two inmates received separate mailings from different outside individuals. The envelopes were standard letter size, and had only one stamp per envelope. Presumptive testing using Marquis Reagent and ultraviolet light on the letters, the glued areas on the envelope flap, the stamps, and the stamp glue were all negative. However, analysis of the paper underlying where the stamps were adhered were presumptively positive for methamphetamine. Extraction with methanol followed by analysis of the extract by GC/MS confirmed methamphetamine (quantitation not performed). This was the second such submission to the Laboratory; however, the previous submission was negative for any controlled substances.

[Editor's Notes: According to the analyst, although quantitation was not performed, the amount of methamphetamine per envelope was rather small, based on the GC/MS response. The analyst also stated that their experience has shown that the envelope paper (especially under the stamp area) must be analyzed when this technique is suspected. There have been a number of similar submissions reported to *Microgram Bulletin* over the past few years, primarily reporting small amounts of heroin under stamps, or paper laced with methamphetamine.]

\* \* \* \* \*

### **- INTELLIGENCE ALERT -**

#### **SATURATED AQUEOUS METHAMPHETAMINE HYDROCHLORIDE IN A WATER BOTTLE IN SAN JOSE, CALIFORNIA**

The DEA Western Laboratory (San Francisco, California) recently received a plastic 500 milliliter bottle of Refreshe brand spring water that contained approximately 100 milliliters of green-brown, slightly basic, aqueous solution, suspected to be an aqueous solution of methamphetamine hydrochloride (see Photo 3). The bottle was recovered from a hidden compartment in a vehicle in San Jose, subsequent to a consent search by agents from the DEA San Jose Resident Office. Analyses of the solution by GC, GC/MS, and GC/IRD, and a chiral derivatization, confirmed 542 milligrams/milliliter of *d*-methamphetamine hydrochloride (total net mass 54 grams) with trace 1-phenyl-2-propanone (P-2-P). This was the second submission of a saturated aqueous solution of methamphetamine hydrochloride in a plastic bottle to the Laboratory within the past year.



**Photo 3**

[Editor's Note: According to the analyst, there was no dimethylsulfone or any other cutting agent(s) in the solution; therefore, the relatively high concentration suggests that the solution was an intermediate preparation of "Ice" methamphetamine (that is, prior to cooling or evaporation to form crystals).]

**- INTELLIGENCE ALERT -**

**COCAINE IN A PSEUDO-OPERATIONAL CAR BATTERY SUBMERGED  
IN A TUB OF JOINT COMPOUND IN WHEATON, MARYLAND**

The DEA Mid-Atlantic Laboratory (Largo, Maryland) recently received a very unusual submission consisting of an apparently operational car battery submerged in a 5-gallon tub of joint compound, suspected to contain cocaine (see Photo 4). The exhibit was seized from the trunk of a vehicle in Wheaton, Maryland by DEA Agents and Officers from the Montgomery County Police Department. The tub showed no evidence of tampering, and the lid slots had not been cut. Upon disassembly, the battery (dimensions: 25.9 x 16.9 x 20.0 centimeters) was found to have a second, smaller, rechargeable battery inside, internally wired to the main battery's electrodes to create an apparently operational battery (see Photo 5). Also inside the main battery case were five kilo bricks (four marked 1000, one marked 1100) and one smaller compressed brick (marked 300) of compressed powder, plus a wrapped plastic bag of powder (marked 100) (see Photos 6 and 7). Analysis of the powder (total net mass 5472 grams) by GC, GC/MS, and FT-IR confirmed 84 percent cocaine hydrochloride adulterated with caffeine. This was the laboratory's first encounter with this type of smuggling technique.



**Photo 4**



**Photo 5**



**Photo 6**



**Photo 7**

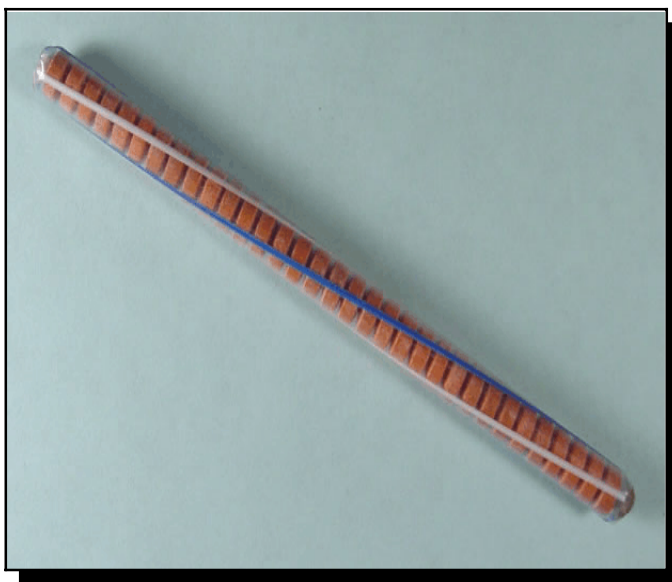


**- INTELLIGENCE ALERT -**

**“YA-BA” TABLETS SEALED IN PLASTIC STRAWS IN HONOLULU, HAWAII**

The Source Determination Program of the DEA Special Testing and Research Laboratory (Dulles, Virginia) recently received some “Ya-Ba” tablets (also known as “Thai Tabs”) heat-sealed in what appeared to be plastic drinking straws. The exhibits were mailed from Thailand to Elverta, California and were seized *en route* at the United States Customs mail facility in Honolulu, Hawaii. The first subexhibit was a clear straw with blue and white stripes containing 33 tablets (see Photo 8); the second subexhibit included five short, translucent white straws containing four tablets each (see Photo 9); and the third subexhibit included three reddish colored straws containing 48 tablets total (see Photo 10). In each case, the majority of the tablets were red except for the tablets at each end; in the latter cases, the side of the tablet facing the seal was white - presumably discolored during the heat-sealing process. Except for one tablet, all tablets were 6 millimeters in diameter, and had a variation of the standard “WY” logo. Analysis by GC, GC/MS, IR, and CE confirmed 21-25 milligrams of *d*-methamphetamine hydrochloride and 60-67 milligrams of caffeine per tablet. The lone exception had 6.7 milligrams of *d*-methamphetamine hydrochloride and 40 milligrams of caffeine. This is the first time the Laboratory has encountered this packaging technique.

[Editor’s Note: An overview of “Ya-Ba” tablets was presented in the July 2003 issue of *Microgram Bulletin*.]



**Photo 8**



**Photo 9**



**Photo 10**



**- INTELLIGENCE ALERT -**

**EPHEDRINE FROM LIVESTOCK MINERAL BLOCKS SCAM ENCOUNTERED  
IN BARRY COUNTY, MISSOURI**

[From the NDIC *Narcotics Digest Weekly* 2003;2(49):2  
Unclassified, Reprinted with Permission.]

Investigators from the Southwest Missouri Drug Task Force report that a defendant arrested for possessing chemicals used in the production of methamphetamine alleged that he was able to extract ephedrine from livestock mineral blocks. On November 4, 2003, investigators went to the defendant's Barry County home after witnessing an unusually large number of persons coming and going. Investigators state that they previously had seized chemicals used in the production of methamphetamine at the defendant's home. Upon speaking to the defendant, they again discovered he possessed chemicals including anhydrous ammonia, lye, and ether. Investigators also found trace quantities of methamphetamine at the home. During their discussion with the defendant, he provided the investigators with a recipe for allegedly extracting ephedrine from mineral blocks. According to the recipe, ephedrine could be obtained by sending a 220-volt current through a bucket containing a livestock mineral block. The defendant was arrested and charged with possession of anhydrous ammonia in an unapproved container.

NDIC Comment: Law enforcement officers in other Midwest states also have reported discoveries of mineral or salt blocks as well as chicken feed and empty chicken feed sacks at methamphetamine laboratory sites. Some of these officers have speculated that producers might extract ephedrine or pseudoephedrine from these products. However, according to Drug Enforcement Administration (DEA) chemists, recipes suggesting that ephedrine or pseudoephedrine can be extracted from chicken feed or livestock mineral blocks for use in methamphetamine production are erroneous. Moreover, scientists from a major livestock feed producing company reviewed contents of mineral blocks and chicken feed and concluded that these products contain no ephedrine or pseudoephedrine. Mineral blocks, however, do contain salt that might be extracted for use in the methamphetamine production process.

\* \* \* \* \*

**- INTELLIGENCE ALERT -**

**MARIJUANA IN FACTORY-SEALED CANS IN LAWRENCE COUNTY, MISSOURI**

[From the NDIC *Narcotics Digest Weekly* 2003;2(49):3  
Unclassified, Reprinted with Permission.]

On November 8, 2003, officers with the Missouri State Highway Patrol (MSHP) in Lawrence County seized approximately 200 pounds of marijuana that were concealed in food cans that appeared to be factory-sealed. After stopping an SUV that was traveling east on Interstate 44 for speeding, an MSHP officer became suspicious when the driver provided conflicting information about the nature of his travel. The officer requested and received consent to search the vehicle,

and he and other assisting MSHP officers discovered 43 cans that appeared to be factory-sealed in the rear cargo compartment of the SUV. The large size cans (number 10) bore commercial labels from legitimate food companies. The labels suggested that the contents of the cans were jalapeños, tomatoes, tomato sauce, and white hominy. After the officers discovered the cans, the driver continued to provide conflicting information about the nature of his travels as well as his reason for transporting the cans. The officers further inspected one of the cans, opening it to discover a brick of marijuana weighing 4.7 pounds. A subsequent inspection of all the cans revealed that each of them contained similar bricks of marijuana. The driver--a resident of Hamilton County (OH)--was arrested and charged with possession of marijuana with intent to distribute. Two passengers in the SUV were released. Officers believe that the cans were packaged in Mexico and possibly were being transported from Los Angeles (CA) to Cincinnati (OH) at the time of the interdiction. Agents from the DEA Springfield Resident Office assisted in the investigation.

NDIC Comment: Hiding illicit drugs in food cans that appear to be factory-sealed presents a particularly challenging concealment technique for law enforcement officers to uncover. In many instances the cans are completely sealed, bear legitimate commercial labels, and weigh approximately the same as the weight identified on the label. In the above incident, the traffickers had wrapped bricks of marijuana in plastic and placed each brick inside a can with enough water to provide the "feel" of a legitimate food product and the approximate weight of 3 kilograms to correspond to the product label. Other seizures of marijuana from food cans that appear to be factory-sealed previously have occurred in the United States. Examples of these seizures include more than 10,000 kilograms of marijuana in canned drinks from Jamaica and nearly 1 kilogram of BC Bud marijuana in maple syrup cans from Quebec.

- - - - -

[Editor's (Additional) Note: This methodology (smuggling controlled substances in factory-sealed cans) has also been reported for cocaine, heroin, and methamphetamine in several recent issues of *Microgram Bulletin* and (earlier) in *Microgram*.]

\* \* \* \* \*

## **- INTELLIGENCE BRIEF -**

### **5-METHOXY-*ALPHA*-METHYLTRYPTAMINE IN SOUTHWEST MICHIGAN**

The Lansing Forensic Laboratory (Lansing, MI) recently received 10 milligrams of white powder contained in a foil package, suspected methamphetamine (photo not taken). The exhibit was submitted by the South West Enforcement Team (SWET; a drug task force administered by the Michigan State Police), and was included with a number of exhibits seized during a raid at a methamphetamine laboratory in Southwest Michigan (exact locale withheld). Analysis by GC-MS, however, indicated not methamphetamine but rather 5-methoxy-*alpha*-methyltryptamine (5-MeO-AMT), based on the mass spectrum reported in the May 2003 issue of *Microgram Bulletin*. This is the laboratory's first encounter with 5-MeO-AMT. Three other exhibits submitted in the case contained a total of approximately 10 grams of methamphetamine.

**- INTELLIGENCE BRIEF -**

**UNUSUAL POLYDRUG SEIZURE IN ELLSWORTH, KANSAS**

The Kansas Bureau of Investigation Laboratory (Great Bend, Kansas) recently received a polydrug submission from the Ellsworth County Sheriff's Office that included a variety of tablets and pills. The drug exhibits, and \$1400 cash, were recovered from a backpack that was found at an accident scene on I-70 in Ellsworth County where a vehicle rolled off the road (Ellsworth County is located about 150 miles west of Topeka). Included in the submission were: A) 21 clear capsules that contained white powder (Photo 11), total net mass not recorded; analysis by color tests and GC/MS indicated 4-bromo-2,5-dimethoxyphenethylamine (2C-B). B) 100 tan round tablets with the Rolex "crown" logo (Photo 12), total net mass not recorded; analysis by color tests and GC/MS indicated a (roughly) 3:1 mixture of MDMA and methamphetamine. C) 50 brownish colored, presumed LSD micro-tablets (Photo 13), total net mass not recorded; analysis by TLC and GC/MS confirmed LSD. D) 20 milligrams of white powder in a folded piece of paper; analysis by GC/MS indicated presumed 2,5-dimethoxy-4-ethylthiophenethylamine (2C-T-2) (standard not available). Additional subexhibits included psilocybin mushrooms, marijuana, hashish, diazepam tablets, and alprazolam tablets (total net masses not reported for any of these subexhibits). None of the various subexhibits were quantitated. This was the Laboratory's first ever encounter of 2C-B and 2C-T-2. Amusingly, one the three accident victims later called the Ellsworth County Sheriff's Office inquiring about the lost backpack - he claimed that the cash was his, but not the drugs.



**Photo 11**



**Photo 12**



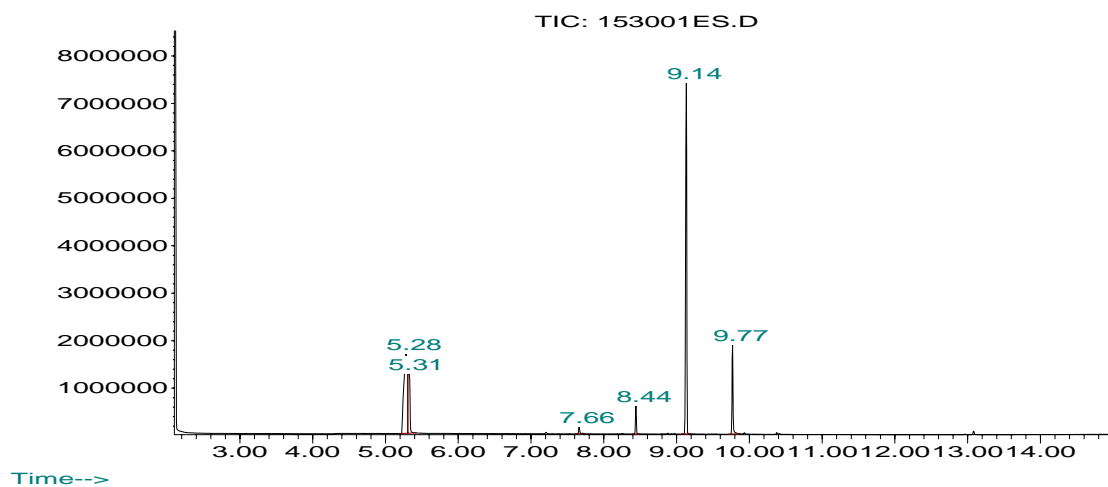
**Photo 13**

- INTELLIGENCE BRIEF -

**METHAMPHETAMINE HYDROCHLORIDE CONTAINING AN UNUSUAL  
SOLVENT MIXTURE IN COUNCIL BLUFFS, IOWA**

The DEA North Central Laboratory (Chicago, Illinois) recently received a submission of 28 packages of suspected methamphetamine, ranging from 200 - 500 grams each, total net mass 7.5 kilograms. The exhibits were seized by the DEA Sioux City HIDTA Group from a distributor in the Council Bluffs, Iowa area. Each package consisted of a clear zip-lock plastic bag wrapped with clear tape containing a moist (oily), off-white crystalline substance. Analysis of these items by GC/MS, FTIR (after sublimation to remove dimethylsulfone), and GC (after a hexane wash) confirmed low quality *d*-methamphetamine hydrochloride, ranging between 2.0 - 3.6 percent purity, cut with over 90 percent dimethylsulfone. Unusually, the residual solvent in the samples was found to be a hydrocarbon mixture including tridecane, tetradecane, pentadecane and hexadecane (that is, C-13 to C-16) in an approximate 1:20:4:2 ratio (see TIC trace below). The presence of this mixture was of particular concern as the laboratory utilizes tridecane as the internal standard in the quantitation of methamphetamine (this necessitated the above referenced hexane wash to remove the residual solvent). Subsequent submissions of liquid samples in the same case were also found to contain methamphetamine, dimethylsulfone and the same hydrocarbon mixture. Various inquiries were unable to determine the identity or source of the unusual hydrocarbon mixture. This was the first encounter with this hydrocarbon mixture at the laboratory.

Abundance



Peaks: 5.3 minutes, dimethylsulfone; 7.7 minutes, unknown; 8.4 minutes, C-13;  
9.1 minutes, C-14; 9.8 minutes, C-15, and ~10.4 minutes, C-16.

\* \* \* \* \*

## **Selected Intelligence Brief**

### **ECSTASY AND CLUB DRUG TRAFFICKING IN THE PACIFIC NORTHWEST**

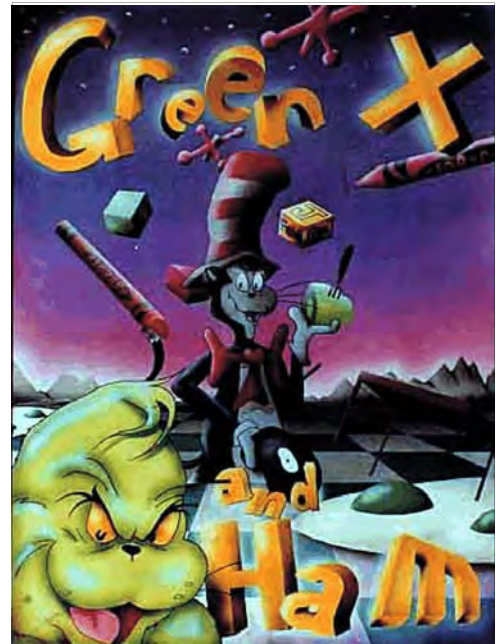
**DEA Seattle Field Division  
Division Intelligence Group**

**206/553-1030**

[Unclassified; Reprinted With Permission]

#### **Summary**

The use and availability of Ecstasy and club drugs have steadily increased in the Seattle Field Division (FD) area of jurisdiction, which comprises Alaska, Idaho, Oregon, and Washington. New medical research confirms decay of the brain or chemical make-up of those who abuse 3,4-methylenedioxymethamphetamine (MDMA), commonly known as Ecstasy, gamma-hydroxybutyrate (GHB), or ketamine. The research also confirms that medically unsupervised withdrawal from GHB can be deadly. Ecstasy and club drugs continue to be popular beyond the rave scene with users in the 12-through-25 age group. Intelligence information, based upon enforcement action and confidential source information, reveals that MDMA pills and powder, ketamine, and other synthetic drugs are smuggled over the borders and throughout the United States by mail, car, air, and boat from European, Mexican, and possibly domestic origins. Trends show that the complex and highly organized polydrug distribution organizations operating within and throughout the Seattle FD are tapping into the wide-profit margin of MDMA trafficking.



Increased law enforcement and media attention to Ecstasy and club drug distribution in the Seattle FD continues to reveal widespread availability. In August 2000, Ecstasy tablets were brought into Oregon from Amsterdam, the Netherlands, and sold at the low price of \$10 per tablet to test the marketability in the Bend area. In September 2000, 100,000 Ecstasy pills destined for Anchorage, Alaska, via commercial airlines, were seized in China. On November 16, 2001, a courier was stopped at Seattle's Tacoma International Airport and arrested for transporting 111,910 MDMA pills. These pills were from Amsterdam. In February 2002, there were seven GHB overdoses at a single rave party in the Portland, Oregon, area. In March 2002, 124 10-milliliter (ml) vials of Mexican ketamine were found in a rental car out of Hillsboro, Oregon. On April 1, 2002, a FedEx package containing approximately 25,000 MDMA pills arrived in Bellevue, Washington, as a controlled delivery. The package was originally from an unknown overseas location, repackaged and sent to New Orleans, then to Nashville, and finally Bellevue.

A Seattle investigation, which ended in March 2002, dismantled a polydrug organization that distributed marijuana, MDMA, and cocaine. A Seattle distributor from this investigation received MDMA pills

from several sources, including sources in California and Nevada. Several Seattle district offices investigations are linked to Canadian sources for MDMA. The Royal Canadian Mounted Police (RCMP) in Vancouver, British Columbia, has noted an increase in the supply of seized MDMA, with 1,000-tablet shipments, known as "boat" shipments, the most common. A case out of Boise, Idaho, successfully prosecuted a rave venue and promoter.



**Cuddle puddle at a Boise Rave**

Ecstasy and club drug use and abuse is a relatively new phenomenon to the medical community in the Northwest, with few hospitals and treatment centers prepared to handle this type of drug abuse. One Seattle hospital, Harborview Medical Center, has been testing for MDMA for only 3 years and for GHB for 2 years. When large raves are held in the greater Seattle area, this hospital receives the patients, since it is one of the few hospitals in the area, which commonly tests for MDMA and GHB.

King County (Seattle, Washington) Drug Abuse Trends reports on the abuse of GHB. Emergency rooms report incidents of intoxication and incapacitation occurring at the rate of two to three per week, and GHB is regularly being tested for in driving under the influence (DUI) incidents. Medical research has compared severe GHB withdrawal to heroin withdrawal.

The Seattle FD, in conjunction with local law enforcement authorities, continues to target Ecstasy and club drug traffickers on multiple levels of distribution, as well as targeting drug activity at raves. New information, regarding precursor chemicals related to MDMA production and the analogs of GHB, has produced investigative leads toward traffickers and MDMA laboratory activity in the Seattle FD.

### **Patterns of Use and Impact to Society**

Since January 2001, the Source Determination Program (SDP) at the Special Testing Laboratory in Virginia has produced a Club Drug Monthly Report. The program reports on Ecstasy and club drug seizures nationwide, tracks ballistics, provides a description of the tablet monogram and other physical characteristics, and identifies the current and past cases from that particular illicit tableting source. According to the SDP Club Drug Monthly Report, released in February 2002, MDMA pills purchased in a closed Seattle investigation had similar markings as pills purchased or seized in cases out of Illinois, Maryland, New Jersey, New York, and Virginia. The pills, which were seized at the Newark, New Jersey, airport, arrived from an Amsterdam flight. The pills seized in Buffalo, New York, were found during a search of a vehicle crossing the U.S.-Canadian border.



**Seized Ecstasy Pills**

The Club Drug Monthly Report dated November 2001, identified pills, seized at the Portland Airport in August 2001, that were found to have similar ballistic markings as pills seized or purchased in Florida, Maine, and New Mexico, New York, and Virginia.



The Alaska State Crime Laboratory, for the years 2000 through 2001 (up to May 9, 2001), documented 2 submissions of MDMA powder, totaling .5 grams; 9 submissions of MDMA tablets, totaling 1,199 tablets; and 18 submissions of LSD, with 1,630 total hits and 21 ml of liquid. There have been no reports of GHB and ketamine seizures from the Alaska State Laboratory.

The Washington State Crime Laboratory, for the years 2000 through 2001 (up to April 19, 2001), had 174 submissions of MDMA, 43 submissions of MDA (an analog of MDMA), and 44 submissions of LSD. There have been no reports of GHB and ketamine seizures from the Washington State Laboratory.

The Idaho State Crime Laboratory, for the years 2000 through 2001 (as of May 7, 2001), noted 27 MDMA submissions, 2 MDA submissions, 35 LSD submissions, and 3 submissions of 1,4-butanediol (an analog of GHB).

Oregon State Laboratories no longer maintain drug submission statistics, but report that MDMA submissions occur almost daily at the Portland Laboratory. These submissions are mostly in tablet form, and frequently turn out to be MDA. There has been a notable increase in ketamine submissions since November 2000. GHB has been seen in some DUI investigation submissions.

## Use and Treatment

According to The Partnership for a Drug Free America annual survey, the number of teenagers across America who said that they have tried Ecstasy rose by 20 percent in 2001, and 71 percent since 1999. The survey of 6,937 teenagers found that 12 percent of 12-to-18 year olds had used MDMA at some point in their lives.

According to the June 2002 issue of Recent Drug Abuse Trends for Seattle, MDMA and GHB emergency department mentions during the first half of 2001 decreased by 14 percent. GHB use among gay men in bathhouses, bars, and sex clubs is reportedly increasing, particularly among men under the age of 30. The King County Medical Examiner reports no deaths during the second half of 2001 involving ketamine or GHB. There was one death from MDMA reported, a 15-year-old female. From 1999 through 2001, there were a total of five MDMA-related deaths. All were Caucasian, between the ages 15 and 28; three had only MDMA present, while one also had methamphetamine, and also had cocaine detected. A survey given to 71 participants of a substance abuse recovery program in Seattle reveals that 44 percent of patients, aged between 14 and 24 years, reported having ever used MDMA, while 30 percent had used this drug in the last 6 months. The survey also showed that 14 percent of patients, aged between 14 and 24 years, reported having ever used ketamine, while 6 percent had used this drug in the last 6 months.

Data collected in November 2000 from the Washington State Survey on Adolescent Health Behaviors revealed King County (Seattle area) youth using Ecstasy and similar club drugs as early as in 6th grade. Young respondents indicated they had used MDMA and related compounds within 30 days prior to taking the survey at the following rates:

6 <sup>th</sup> grade	about 1.0 percent
8 <sup>th</sup> grade	about 3.7 percent
10 <sup>th</sup> grade	about 6.2 percent
12 <sup>th</sup> grade	about 9.0 percent

From January to October 2000, there were 12 GHB-related DUI cases in Washington State. Several sexual assault victims have been admitted to Seattle's King County area hospitals with symptoms similar to GHB intoxication, but due to its rapid elimination from the body, only one sexual assault case has tested positive for GHB to date. Additionally, only one GHB-related death has been reported in Washington State as of July 2002.

### **Trafficking Routes and Smuggling Methods**

Ecstasy and club drug investigations in the Northwest have confirmed transport of MDMA from trafficking organizations based out of the Las Vegas, Nevada, area to Seattle. These investigations have also discovered that MDMA is produced in Bulgaria, then smuggled through Greece and Western Europe to the United States.

In November 2001, a courier was apprehended at Seattle's Tacoma International Airport smuggling approximately 111,910 MDMA pills, disguised as a wrapped birthday gift, in her baggage. Through further investigation and interviews, the MDMA had originated from Amsterdam and the courier had recently made trips to other destination points in the United States, including New Jersey and Texas.

In April 2002, MDMA was discovered at a storage unit, hidden in pieces of lumber, in Tukwila, Washington. Further investigation revealed a connection to an international MDMA trafficking organization, which ships the MDMA in lumber from Israel to Romania, to a warehouse in Miami, Florida.



**Seized Ketamine**

According to the Asian Organized Crime Meeting on February 6, 2002, high levels of ketamine have been discovered in seized Ecstasy. Ketamine has been shipped as "health food" and carried as contact lens solution. According to information gained from an Ecstasy and Club drug investigation in Boise, Idaho, ketamine and LSD are moved by car from Portland to Boise.

In March 2002, two packages, containing approximately 25,000 MDMA pills, were sent out from Europe, shipped to New Orleans, then to Nashville, and in-route to Bellevue, via FedEx. All the mentioned destinations were rented business offices. These packages were associated with an organization that smuggles the MDMA from Amsterdam and Germany into the United States via commercial flights.

In March 2002, a Hertz car rental company representative contacted the Hillsboro, Oregon, Police Department to report that several plastic bags containing 124 10-ml vials of TTOKKYO and KETAPHORTE brands of Mexican ketamine were pulled from the door panels of a rental car.

On April 21, 2002, the Missouri State Highway Patrol conducted a traffic stop on a rental sport utility vehicle from California. Upon inspection, 3,998 10-ml vials of TTOKKYO brand Mexican ketamine were found, and both driver and passenger were detained. The passenger had a valid Washington driver's license and was traveling from California to New York.

At the 2002 Club Drugs Conference in Sun Valley, Idaho, an Ecstasy and club drugs expert, Dr. Gauvin, stated that a courier was apprehended in Illinois transporting MDMA by ingesting balloons. Authorities

recovered 232 balloons from the individual, with each balloon containing from 5 to 6 pills.

### **Manufacturing and Chemical Diversion**

A chemical company out of Texas, provided customers with 1,4-butanediol, an analog of GHB, and precursor chemicals for the manufacture of MDMA. According to the seized customer list, there were various 1,4-butanediol customers in Washington, Oregon, and Idaho. According to the seized customer list, there were customers of Ecstasy-related precursor chemicals in Washington, Oregon, and Alaska. While only one Ecstasy laboratory has been seized in the Northwest since 1998, the appearance of more clandestine MDMA laboratories seems inevitable.



**GHB**

A Paris company sold sassafras oil off their Internet site until September 2001, when French legislation banned the import or export of these chemicals. Safrole, an ingredient used in the manufacture of MDMA can be easily extracted from the oil. Both safrole and sassafras oil are controlled chemicals in the United States, and cannot be imported without authorization. In January 2002, the Paris company passed along their list of U.S. customers who purchased sassafras oil before September 2001. Individuals were identified and provided Seattle addresses for their orders of sassafras oil placed in May and September 2000. One customer in Seattle purchased sassafras oil from this site, and Ecstasy-related chemicals from a chemical company during the same month.

A nationwide investigation began in July 2002, regarding the sale and distribution of 1,4-butanediol and GBL, analogs of GHB. The target Internet companies distributed nationwide to include customers in Idaho, Oregon, and Washington.

According to the EPIC database, there were 5 MDMA clandestine laboratories seized nationwide (including federal, state, and local totals) in 1998, 19 seized in 1999, 8 seized in 2000, 20 seized in 2001, and 4 seized as of July 12, 2002. The only Northwest MDMA laboratory seized was in Oregon in 1998.

In the lower mainland of Canada, which includes the city of Vancouver and the surrounding municipalities, four MDMA laboratories were seized in 1999, two seized in 2000, and five seized through December 3, 2001. These statistics include active, producing laboratories, as well as stored chemicals and static laboratories.



**MDMA "Ying-Yang" Tablets  
Seized by DEA**

According to the RCMP "E" Division Headquarters, two GHB laboratories were discovered in Oregon early in 2002. The first laboratory, which was discovered on January 24, 2002, was in conjunction with the discovery of a methamphetamine laboratory. According to agents, the defendant had ordered GBL from a Canadian company. The company would then mail between 10 and 15 1-pint containers, disguised as fingernail polish remover. The defendant would then heat up the GBL, add sodium hydroxide, use pH test strips to find the desired level, then package the final product in old water and pop bottles.

A mushroom grow was discovered 40 miles north of Spokane, Washington, on May 7, 2002, by the Pend Oreille Sheriff's Department.

In June 2002, authorities followed suspects to a storage shed in Everett, Washington, where a large crate was loaded into a van. Once at the Canadian border, the suspects' van was searched, and a pill press with positive MDMA residue was found in the crate.

### **Pharmacological Effects**

According to the British Journal of Pharmacology, a recent study on the effects of ketamine found that abuse of the chemical permanently damages the neurons, leaving visible holes in the cortex of the brain.

A "quality" tablet of Ecstasy contains an average of between 75 and 100 milligrams (mg) of MDMA. For the average person, a normal dose is between 75 mg and 125 mg. The experienced high can last from 3 to 5 hours.

The short-term effects of MDMA abuse consist of accelerated heart rate, increased blood pressure, muscle cramps, panic attacks, fainting episodes, overheated internal organs, and dehydration.

According to the National Institute on Drug Abuse (NIDA), medical research has found that MDMA has been linked to long-term damage to those parts of the brain critical to thought and memory. This drug kills off the part of the nerve in the brain that releases serotonin, the chemical which controls sleep, sexual function, memory, appetite, and mood. As a result, it takes time for the human brain to rebuild its serotonin levels. For people who take MDMA in moderate to high doses, this depletion of serotonin may be long-term. There has also been evidence of liver damage associated with consistent use of this drug.

According to a study published in the November 2001 issue of The Lancet Medical Journal, Ecstasy may cause more brain damage in women than in men. The study compared brain scans of people who had taken 50 or more MDMA tablets in their lifetimes with those of a group who had never taken the drug. The findings indicated that women lost a more significant number of brain cells than men, even though the men had taken more MDMA over the years. The research team stated that larger studies will be needed to confirm the results.

In a report published in the May 1, 2001, issue of the Journal of Neuroscience, researchers found the first evidence that a mother's use of MDMA during pregnancy may result in specific types of long-term learning and memory impairments in her children. This research, conducted in a laboratory, found that the Ecstasy-induced impairment in both sequential and spatial memory-based learning was long term, and was still apparent after the individual reached adulthood.

Data from a new study by Dutch researchers suggests that psychological problems and memory deficiencies associated with regular MDMA use are not reversed by prolonged abstinence. MDMA has also been found to cause premature aging.

The short-term effects of GHB include an overall drunken appearance with slurred speech, loss of muscle coordination, low vital signs and unconsciousness. Medical research concludes that there is a high risk of addiction through daily use of GHB or its precursors. Withdrawals from GHB have been compared in the medical field to heroin withdrawal, and can be deadly without physician supervision.

## Legislation

As of May 1, 2001, the federal penalties for MDMA distribution rose, while the amount required for prosecution fell. Under the new sentencing guidelines, a seizure of approximately 800 tablets will result in from 78 to 175 months' imprisonment.

On November 7, 2001, the Food and Drug Administration (FDA) granted approval for medical research of Ecstasy as a treatment of post-traumatic stress disorder. The study is financed by the Multidisciplinary Association for the Psychedelic Studies, which advocates the use of psychedelic drugs for therapy.

On November 15, 2001, the Seattle Post Intelligencer newspaper reported the November 6, 2001, arrest of a Portland man for distribution of MDMA to a 19-year-old woman who later died. The suspect will be the first Oregon trafficker to face prosecution for the death of a user. The 20-year-old trafficker was charged with manslaughter and distributing a controlled substance.

In March 4, 2002, Oregon adopted an emergency temporary rule which amended the state's list of Schedule I Controlled Substances to include GBL and 1-4 butanediol. On July 17, 2002, the FDA approved GHB as a Schedule III drug in the treatment and research of cataplexy, a rare form of narcolepsy.

## Emerging Trends

### Synthetics

Drug traffickers are searching for synthetics with similar MDMA effects to sell to customers in order to bypass the controlled substances laws; however, these drugs may be prosecutable under the analog acts. In March 2002, the Bureau of Customs and Border Protection in Anchorage seized a package containing \$9,900 and an order for alpha-methyltryptamine (AMT) and 5-methoxy-N,N-diisopropyltryptamine (5MeO-DIPT). The order was sent from China to a business in Phoenix, Arizona, which sold the chemicals over the Internet. In a Boise investigation, an individual was prosecuted under the analog act for distribution of 5MeO-DIPT, known as "Foxy" and "Foxy Methoxy."



**Various Forms of 2C-B**

The drug, 4-bromo-2, 5-dimethoxyphenethylamine (2C-B), known as "Nexus," has recently been identified in the Seattle FD. Nexus is frequently discussed in Northwest rave chat rooms on the Internet, and has appeared in other DEA investigations throughout the nation. Diethyltryptamine (DET), a drug first invented to imitate a psychotic state for psychological/medical experiments, has appeared in the Boise rave scene.

The synthetic, 2,5-dimethoxy-4-(N)-propylthiophenethylamine (2-CT-7), also known as "Blue Mystic," is a common drug in the Ecstasy and club drug scene. There has only been one noted death from 2-CT-7 at



Harborview Medical Center in Seattle. The toxicology report states that the individual died of MDMA toxicity; however, 2-CT-7 was noted in the opinion portion of the autopsy report. This synthetic is regularly discussed on drug websites, and has been noted in two deaths out of Oklahoma and Tennessee.

On July 18, 2002, 2-CT-7 structurally related to Schedule I, 2C-B and other Schedule I hallucinogens, DOM and DOB, was placed on an emergency scheduling notice, with the intent to deem 2-CT-7 a Schedule I drug. The synthetic, 2-CT-7, produces visual hallucinations and is a sulfur analog of 2C-B.



**Vial of 2-CT-7**



**2-CT-7 Pills**

A new trend noted around the nation is the sale of benzylpiperazine (BZP) as Ecstasy. On July 18, 2002, BZP and 1-3-trifluoromethylphenyl (TFMPP), promoted as legal alternatives to Ecstasy, were placed on an emergency scheduling notice with the intent to deem them Schedule I drugs. BZP acts as a stimulant similar in effects to amphetamine, producing euphoria and increased heart rate, systolic blood pressure and pulse rate. TFMPP produces hallucinogen-like effects and is a serotonin-releasing agent and binds to serotonin receptors in the brain. Another trend noted is the use of various prescribed benzodiazepines, taking the place of Rohypnol, in sexual assaults.

## **Violence**

On January 23, 2002, federal search warrants were served at several residences and businesses to conclude a Seattle investigation. Fourteen guns were seized during the search warrants.

On February 21, 2002, a jury convicted a target from a Boise MDMA investigation, for distributing MDMA and possession of a firearm during trafficking.

## **Drug Combinations**

In the Corvallis, Oregon, area, a distributor trafficks a combination of MDMA and heroin, called H-bombs, or Yellowjackets. A new combination, CK, is a mixture of cocaine and ketamine. This mixture is usually taken in snorts from an inhaler, with 40 mg per snort. Another new combination, called Trail Mix or Chex Mix, contains Viagra and MDMA, or Viagra, MDMA, and cocaine. In Salem, Oregon, a new combination was noted that combined ketamine and LSD.

## **Other Cases**

The U.S. Air Force Base at Mountain Home, Idaho, has reported an increase in MDMA cases and cites MDMA as the second most frequently abused drug by airmen stationed at the base. The U.S. Navy declared certain rave venues in the Seattle area and events sponsored by certain rave promoters off-limits to personnel because of an increase in the MDMA trafficking and use. Military units in Anchorage and



Fairbanks, Alaska, have noted an increase in drug-test failures because of Ecstasy use.

Polydrug organizations are tapping into the wide-profit margin of MDMA trafficking. In Seattle cases, marijuana and cocaine traffickers also supply MDMA. In a Seattle investigation, a Canadian MDMA source of supply has offered an exchange of MDMA for cocaine.

## Conclusion

MDMA distribution organizations in the Seattle FD continue to supply users with the "hug drug" and its analogs. Research has shown that the public, school personnel, medical professionals, and some local law enforcement agencies are unaware of the dangers of these drugs and the severity of abuse. The widespread Ecstasy and club drug culture has overrun the rave party boundaries, blending with the mainstream. Education and increased public awareness about these Ecstasy and club drugs, deemed harmless by their appearance and clandestine marketing, will highlight them as detrimental and dangerous chemicals. Increased law enforcement presence in the local Ecstasy and club drug scenes may discourage the trafficking and use of these drugs. DEA's coordinated effort in targeting Ecstasy and club drug traffickers, including rave promoters and venues nationwide will ultimately identify international sources for these drugs.

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## SELECTED REFERENCES

[Note: Selected references are a compilation of recent publications of presumed interest to forensic chemists. Unless otherwise stated, all listed citations are published in English. If available, the email address for the primary author is provided as the contact information. Listed mailing address information (which is sometimes cryptic or incomplete) exactly duplicates that provided by the abstracting services.]

1. James SH, Nordby JJ, Eds. **Forensic science: An introduction to scientific and investigative techniques**. CRC Press LLC: Boca Raton, FL. [Editor's Notes: No abstract was provided. The book is reviewed by RE Gaensslen in *Pharmaceutical Research* 2003;20(9):1516. Contact: USA (no further addressing information was provided).]
2. Niemann RA, Gay ML. **Determination of ephedrine alkaloids and synephrine in dietary supplements by column-switching cation exchange high-performance liquid chromatography with scanning-wavelength ultraviolet and fluorescence detection**. *Journal of Agricultural and Food Chemistry* 2003;51(19):5630. [Editor's Notes: The title analysis was performed on various dietary supplement products. Contact: RA Niemann, US FDA, Ctr Food Safety & Appl Nutr, 5100 Paint Branch Pkwy, College Pk, MD 20740.]
3. Tsujikawa K, Kanamori T, Iwata Y, Ohmae Y, Sugita R, Inoue H, Kishi T. **Morphological and chemical analysis of magic mushrooms in Japan**. *Forensic Science International* 2003;138(1-3):85. [Editor's Notes: Analyses included the complementary use of a scanning electron microscope (SEM), along with standard microscopy and HPLC/UV. Listed substrates included *Psilocybe cubensis* and *Copelandia*. Contact: National Research Institute of Police Science, 6-3-1 Kashiwanoha, Kashiwa, Chiba 277-0882, Japan.]

4. Fucci N. **Growing cannabis with naphthalene in Rome.** Forensic Science International 2003;138(1-3):91. [Editor's Notes: Presents the analysis of marijuana that was treated with naphthalene as a pesticide in a moderate sized home grow operation (80 plants); naphthalene was found in high concentration in the marijuana. Contact: [fortox@rm.unicatt.it](mailto:fortox@rm.unicatt.it)]
5. Muratsu S. **An application of synchrotron radiation to the analysis of forensic samples, mainly drugs of abuse.** Bunseki Kagaku 2003;52(11):1061. [Editor's Notes: No abstract was provided. This article is written in Japanese. Contact: Japan (no further addressing information was provided).]

#### **Additional References of Possible Interest:**

1. Al-Motarreb A, Baker K, Broadley KJ. **Khat: Pharmaceutical and medical aspects and its social use in Yemen.** Phytotherapy Research 2002;16:403. [Editor's Notes: Includes an overview of the history, cultivation, and constituents of khat; however, primary focus appears to be pharmacology. Contact: Dept of Pharmacology, Welsh School of Pharmacy, Cardiff University, Cathays Park, Cardiff, CF10 3XF, UK.]
2. Wong SK, Tsui SK, Kwan SY. **Analysis of proprietary Chinese medicines for the presence of toxic ingredients by LC/MS/MS.** J Pharm Biomed Anal 2002;30:161. [Editor's Notes: Presents the title analysis of 12 products. Contact: Hong Kong Government Laboratory, 88 Chung Hau Street, Homantin, Hong Kong.]
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4. Madej K, Wozniakiewicz M. **Application of capillary electrophoresis to analysis of tricyclic psychotropic drugs.** Z-Zagadnien-Nauk-Sadowych 2002;52:52. [Editor's Notes: Includes the analyses of pharmaceutical products containing promazine and desipramine. Contact: Faculty of Chemistry, Jagiellonian University, Cracow, Poland.]
5. Shearer GL. **Contaminant identification in pharmaceutical products.** Microscope 2003;51(1):3. [Editor's Notes: Presents a review of the title topic. Contact: 850 Pasquinelli Drive, Westmont, IL 60559.]
6. Yudko E, Hall HV, McPherson SB, Eds. **Methamphetamine use: Clinical and forensic aspects.** CRC Press LLC: Boca Raton, Fla.) 2003. [Editor's Notes: No abstract was provided. Contact: USA (no further addressing information was provided).]
7. Steckley SL, Darwin WD, Henningfield JE, Huestis MA, Pickworth WB. **Letter to the Editor: Eclipse can deliver crack cocaine.** Nicotine and Tobacco Research 2002;4(Suppl. 2):S189. [Editor's Notes: Presents an investigation of the adaptive use of a commercial nicotine delivery device for smoking crack. Contact: Intramural Research Program, National Institute on Drug Abuse, Baltimore, MD (zip code not provided).]
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[Editor's Notes: Presents the use of CE, MECK, and RP-HPLC to analyze for pethidine and MPTP. Unclear from the abstract whether toxicological or forensic focus. Contact: MG Quaglia, Univ Roma La Sapienze, Dipartimento Studi Farmaceut, Lab Pharmaceut Analyt Chem, Piazzale Aldo Moro 5, 1-00 185 Rome, Italy.]

9. Staack RF, Fritschi G, Maurer HH. **New designer drug 1-(3-trifluoromethylphenyl)-piperazine (TFMPP); gas chromatography/mass spectrometry and liquid chromatography/mass spectrometry studies on its phase I and II metabolism and on its toxicological detection in rat urine.** Journal of Mass Spectrometry 2003;38(9):971. [Editor's Notes: The title study is presented; *may* include spectral data (not clear from abstract).]
10. Kiraly B, Sanami T, Doczi R, Csikai J. **Detection of explosives and illicit drugs using neutrons.** Nuclear Instruments & Methods in Physics Research, Section B: Beam Interactions with Materials and Atoms 2003;213:452. [Editor's Notes: Presents a Thermal Neutron Activation technique for the title analyses. The "illicit drugs" were not specified in the abstract. Contact: Institute of Experimental Physics, University of Debrecen, Pf. 105, Debrecen 4010-10, Hung.]
11. Vittiglio G, Bichlmeier S, Klinger P, Heckel J, Fuzhong W, Vincze L, Janssens K, Engstrom P, Rindby A, Dietrich K, Jembrih-Simbürger D, Schreiner M, Denis D, Lakdar A, Lamotte A. **A compact mu-XRF spectrometer for (in situ) analyses of cultural heritage and forensic materials.** Nuclear Instruments & Methods in Physics Research, Section B: Beam Interactions with Materials and Atoms 2003;213:693. [Editor's Notes: XRF = X-ray Fluorescence. The "forensic materials" were not described in the abstract. Contact: Chemistry Department, University of Antwerp, Universiteitsplein 1, Antwerp B-2610, Belg.]
12. Smith WD. **SAW chip sniffs out cocaine.** Analytical Chemistry 2003;75(23):492A. [Editor's Notes: Presents an overview of the use of surface acoustic wave based devices for detecting cocaine vapor or particulate. Contact: No contact information was provided.]
13. Felton MJ. **Lab on a chip: Poised on the brink.** Analytical Chemistry 2003;75(23):505A. [Editor's Notes: Presents a review of the topic, and an overview of the available instrumentation in the field. Contact: No contact information was provided.]
14. Gorecki T, Harynuk J, Panic O. **Comprehensive two-dimensional gas chromatography (GC x GC).** New Horizons and Challenges in Environmental Analysis and Monitoring [Workshop], Gdansk, Poland, Aug. 18-29, 2003, pps 61-83. [Editor's Notes: Presents an overview of the title topic. Presented examples include (unspecified) forensic samples. Contact: Department of Chemistry, University of Waterloo, Waterloo, ON N2L 3G1, Can.]
15. Sychev KS, Sychev SN. **Application of universal mobile phases in high-effective liquid chromatography for analysis of the objects of food industry, criminology and pharmaceutical chemistry.** Zavodskaya Laboratoriya, Diagnostika Materialov 2003;69(9):8. [Editor's Notes: Various diethylammonium based run buffers are examined for RP-HPLC. This article is written in Russian. Contact: Inst. Elementoorgan. Soed. Im. A.N. Nesmeyanova, RAN, Moscow, Russia.]

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## NEW EMAIL ADDRESSES NEEDED

The email addresses for the following organizations have returned rejection notices to the Microgram Editor for the past three issues of *Microgram Bulletin*, and will therefore be dropped from the subscription list unless a corrected email address is provided by February 15, 2004. Note that the errors include “rejected-as-spam”, “mailbox full”, “user not found”, or “user unknown” messages. The Editor requests your assistance in contacting these organizations, determining if they wish to remain on the *Microgram* subscription e-net, and if so asking them to forward a valid email address to the [microgram\\_editor@mailsnare.net](mailto:microgram_editor@mailsnare.net) address.

Alabama Department of Forensic Sciences - Birmingham Laboratory

Alabama Department of Forensic Sciences - Montgomery Laboratory

Bureau of Alcohol, Tobacco, and Firearms Laboratory - San Francisco

Maryland State Police - Berlin Regional Laboratory

Massachusetts Department of Public Safety - Jamaica Plains

Ocean City (Maryland) Police Department Laboratory

Pennsylvania Office of the Attorney General

Tennessee Bureau of Investigation Crime Laboratory - Jackson (may have closed?)

Tennessee Bureau of Investigation Crime Laboratory - Memphis

U.S. Food and Drug Administration - Arkansas Regional Laboratory

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## THE JOURNAL/TEXTBOOK COLLECTION EXCHANGE

### *FREE TO ANY SUBSCRIBER*

Unless otherwise noted, requests for any of the following offerings should be emailed to the *Microgram* Editor at: [microgram\\_editor@mailsnare.net](mailto:microgram_editor@mailsnare.net) Requests should include complete mailing address information, **and should confirm that the provided destination is a “safe” (irradiation free) address.** Unless otherwise noted, in cases of competing requests, libraries have precedence. [Note: Postage for offerings from the DEA Office of Forensic Sciences will be covered by the Office.]

- 1) *Analyst* 2002;127(11,12); 2003;128(1).
- 2) *Analytical Chemistry* 1998 - 2001 (some issues missing).
- 3) *Journal of AOAC International* 1998 - 2002 (some issues missing).
- 4) *Journal of Forensic Sciences* 2000;45(6); 2001;46(2,3,4,5,6); 2002;47(All); 2003;48(1,2).

- 5) *Journal of Medicinal Chemistry* 2001 - 2002 (some issues missing).
- 6) *Journal of Pharmacology and Experimental Therapeutics* 1998 - 2002 (some issues missing).

The next offering of journals and textbooks will be in the April 2004 issue of *Microgram Bulletin*.  
**Subscribers are encouraged to donate surplus or unwanted items or collections; if interested, please consult the *Microgram* website for further instructions.**

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## THE DEA FY - 2004 STATE AND LOCAL FORENSIC CHEMISTS SEMINAR SCHEDULE

The remaining FY - 2004 schedule for the DEA's State and Local Forensic Chemists Seminar is as follows:

February 9 - 13, 2004  
 April 19 - 23, 2004  
 June 14 - 18, 2004  
 September 20 - 24, 2004

Note that the school is open only to forensic chemists working for law enforcement agencies, and is intended for chemists who have completed their agency's internal training program and have also been working on the bench for at least one year. There is no tuition charge for this course. The course is held at the AmeriSuites Hotel in Sterling, Virginia (near the Washington/Dulles International Airport). A copy of the application form is appended onto the October 2003 issue of *Microgram Bulletin*, and should be mailed to the Special Testing and Research Laboratory (Attention: Pam Smith or Jennifer Kerlavage) at: 22624 Dulles Summit Court, Dulles, VA 20166. For additional information, call 703/668-3337.

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## EMPLOYMENT OPPORTUNITIES

### 1. Virginia Department of Criminal Justice Services

(Second Posting)

**Position:** Forensic Scientist II (Controlled Substance Examiners) (Two Positions)

**Location:** Division of Forensic Science, Eastern Laboratory, Norfolk, VA

**Salary:** \$39,901 - \$65,540

**Application Deadline:** Open Until Filled

The Department of Criminal Justice Services is seeking two qualified individuals to perform forensic chemical analyses of suspected controlled substances in the Division of Forensic Science, Eastern Laboratory.

**Duties:** Incumbents will: 1) Use current state-of-the-art methodologies and instrumentation to analyze controlled substances; 2) Prepare Certificates of Analyses on findings for use by the criminal justice system; and 3) Testify in court as a qualified expert for the Commonwealth at criminal proceedings as to the results of laboratory findings. Position requires occasional overnight travel. Employee will provide own transportation as required.

**General Requirements:** Knowledge of basic theoretical principles and applications of the instrumentation and methodologies used to analyze controlled substances required. Knowledge of laboratory safety procedures; quality assurance/quality control and laboratory practices; instrumental analysis (GC, GC/MS, FTIR, UV) and experience in forensic drug analysis required. Successful completion of a documented training program and/or demonstration of competency is required. Experience presenting testimony in a court of law, as an expert witness is preferred. Must be able to analyze data, develop sound conclusions, maintain accurate records, and analyze, and solve technical problems. Ability to communicate effectively orally

and in writing required. A baccalaureate degree in chemistry or other related science with sufficient chemistry courses is required; graduate degree is preferred. Valid driver's license and/or other means of reliable transportation required.

**Application Procedure:** Applicants must submit a state application (#10-012). Applications may be mailed to the Department of Criminal Justice Services, 805 East Broad Street, 10th Floor, Richmond, VA 23219, ATTN: Human Resource Office; emailed to [gcolburn@dcjs.state.va.us](mailto:gcolburn@dcjs.state.va.us) or faxed to 804-786-6484. State application forms may be obtained by calling (804) 786-4246 or by downloading the form from the employment section of the DCJS web page at [www.dcjs.org](http://www.dcjs.org). For assistance, call Gene Colburn at (804) 786-6925.

Notes: Selected candidates must provide a DNA sample via a buccal swab (saliva sample), be fingerprinted, and pass a security background check. Equal Opportunity Employer.

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# Computer Corner

## Common Abbreviations Used in Digital Examinations

# #178

by Michael J. Phelan  
DEA Digital Evidence  
Laboratory

Digital evidence examination case notes often contain abbreviations. The use of abbreviations saves the examiner time in recording the details of the examination process. Abbreviations in a digital evidence laboratory fall into four categories – Subject Matter Specific, Organizational Specific, General Information Technology Terms, and General Forensic Science Terms.

No formal list of acceptable digital evidence examination abbreviations has been published so far. The Scientific Working Group on Digital Evidence (SWGDE) has begun to define technical terms commonly used, but the issue of abbreviations has thus far been ignored.

### Subject Matter Abbreviations

Subject matter specific abbreviations consist of terms commonly encountered during the course of a digital evidence examination that are technical in nature, but not necessarily mainstream information technology terms. Some of the more common subject matter abbreviation used in DEA case notes or on standard DEA Digital Evidence Laboratory forms include:

**A/V:** Anti-virus – refers to virus

detection software;

**B/E:** Best Evidence – refers to the collection of evidence where taking the original is not authorized or physically/technically impossible;

**B/U:** Backup – refers to a process to copy original evidence;

**DD:** Refers to a Unix or Linux command used to copy digital data;

**DUP:** Duplicate – refers to an exact copy;

**FTK:** Forensic Tool Kit – refers to a type of forensic examination software;

**K/W:** Key Word – refers to a term that is search globally across all digital evidence;

**LOG:** Logical – refers to data stored as files or a transaction files created by an operating system or application software;

**ORG:** Original – refers to the original evidence;

**OSB:** On-Site Backup;

**PHY:** Physical – refers to hard drive sectors that contain data;

**S/B:** Safeback – refers to a type of hard drive copy software;

**STEG:** Steganography – refers to a data hiding techniques involving encryption technology;

**VOL:** Volume – refers to the volume label on data storage media;

**W/B:** Write Block – refers to a hardware or software technique to prevent deleterious change to original evidence.

### Organizational Abbreviations

Organizational specific terminology will vary from one law enforcement or forensic organization to another. For example, at DEA the following terminology would be found in typical examination case notes:

**ASAC:** Assistant Special Agent in Charge;

**AUSA:** Assistant United States Attorney;

**CA:** Country Attaché;

**CFE:** Computer Forensic Examiner;

**CO:** Country Office;

**DA:** District Attorney;

**D/I:** Diversion Investigator;

**ET:** Evidence Technician;

**FD:** Field Division;

**G/S:** Group Supervisor;

**I/A:** Intelligence Analyst;

**LD:** Laboratory Director;

**POD:** Post of Duty;

**RAC:** Resident Agent in Charge;

**RO:** Resident Office;

**S/A:** Special Agent;

**SAC:** Special Agent in Charge;

**SFL9:** DEA's Digital Evidence Laboratory designation;

**TF:** Task Force;

**TFA:** Task Force Agent;

**TFO:** Task Force Officer;

**USAO:** United States Attorney's Office.

## General Technical Abbreviations

The digital evidence forensic discipline extensively utilizes general information technology terms. Precise definitions of these terms can be found in most computer textbooks. In fact, several terms have well recognized abbreviations (such as GB) while other terms do not have such universal recognition. Here is a basic list of general information technology technical terms commonly used in digital evidence forensic examination note taking. A comprehensive list could possibly occupy many pages and is as broad as the field of digital technology.

**AMD:** Advanced Micro Devices;  
**BIOS:** Basic Input/Output System;  
**CMOS:** Complementary Metal Oxide Semiconductor;  
**CD-R:** CD Recordable;  
**CD-RW:** CD Rewritable;  
**CPU:** Central Processor Unit;  
**CRC:** Cyclic Redundancy Check;  
**DAT:** Digital Audio Tape;  
**DVD:** Digital Versatile Disk;  
**DLT:** Digital Linear Tape;  
**DOC:** Microsoft Word File;  
**DOS:** Microsoft Disk Operating System;  
**EXE:** Executable Program;  
**FAT:** File Allocation Table;  
**GB:** Gigabyte;  
**HCS:** Heads, Cylinders, Sectors;  
**HEX:** Hexadecimal;  
**HTML:** Hypertext Markup Language;  
**IDE:** Integrated Device Electronics;  
**IP:** Internet Protocol;  
**JPG or JPEG:** Joint

Photographic Experts Group;  
**LBA:** Logical Block Addressing;  
**KB:** Kilobyte;  
**MAC:** Media Access Control or Macintosh Computer;  
**MB:** Megabyte;  
**MBR:** Master Boot Record  
**MD-5:** Binary data summary/algorithm;  
**MFT:** Master File Table;  
**MMX:** Multimedia Extension;  
**MPEG:** Motion Pictures Expert Group;  
**NVRAM:** Non-Volatile Read Only Memory;  
**OS:** Operating System;  
**PART:** Partition;  
**PCI:** Peripheral Component Interconnect;  
**POST:** Power-on Self Test;  
**RAID:** Redundant Array of Inexpensive Disks;  
**RAM:** Random Access Memory;  
**RISC:** Reduced Instruction Set Computer;  
**ROM:** Read Only Memory;  
**SCSI:** Small Computer System Interface;  
**SEC:** Sector;  
**TAR:** Type of data compression;  
**TB:** Terabyte;  
**USB:** Universal Serial Bus;  
**VER:** Version;  
**WINxx:** Microsoft Windows Operating System;  
**ZIP:** Iomega data storage cartridge or a type of data compression.

## General Forensic Abbreviations

The use general forensic science terminology can also be expected to be included in digital evidence examination case notes: Some forensic

science terms frequently referenced at DEA include:

**CON:** Control;  
**EX** or **EXH:** Exhibit;  
**HSE:** Heat Sealed Envelope;  
**M/K:** Make;  
**MOD:** Model;  
**P/N:** Part Number;  
**S/N:** Serial Number.

The list of abbreviations should be included as an appendix to the standard operating procedures and reviewed annually as part of the quality assurance review. The availability of this terminology will facilitate an external review of the case notes and forms.

Questions or comments?  
E-mail: [mphelan@erols.com](mailto:mphelan@erols.com)

# Microgram

## *Bulletin*

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**VOL. XXXVII, NO. 2**

**FEBRUARY 2004**

**- INTELLIGENCE ALERT -**

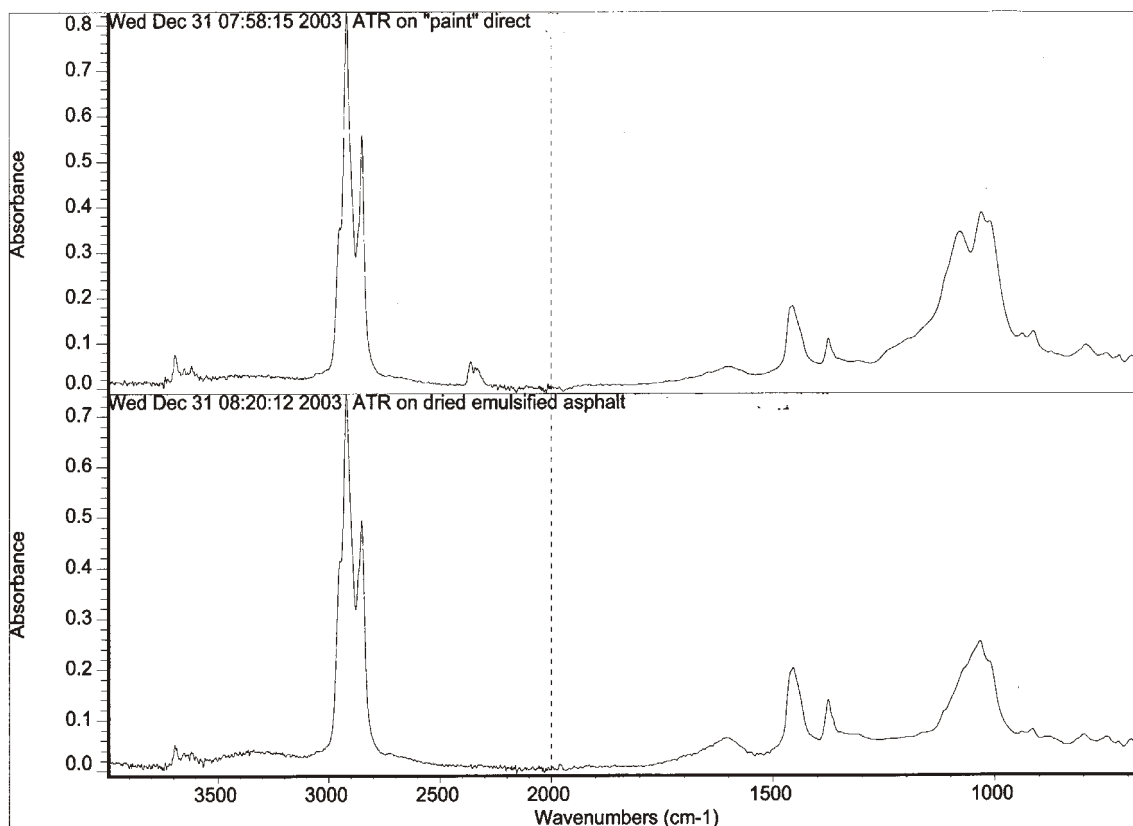
**USE OF TAR AS A SMUGGLING AID ENCOUNTERED  
IN SAN DIEGO, CALIFORNIA**

In mid-2003, a multi-agency task force seized more than three tons of marijuana at a house in San Diego, California. The marijuana was wrapped in plastic that had been coated with grease, then packaged in cardboard boxes that had a thick, soft, very dark brown-black paint coated on the inside surfaces of the boxes (see Photo 1). Intelligence suggested that the coating was a lead-based paint, the alleged purpose of which was to prevent X-ray detection of the contents. A complete analysis was conducted by the DEA Southwest Laboratory (Vista, California) by solubility testing, high-temperature GC, FT-IR (ATR), and NMR. The coating was insoluble in water but very soluble in either chloroform or pet ether. The GC and



**Photo 1**

NMR analyses indicated high molecular weight alkanes (C-30 and greater), which was supported by the FT-IR (ATR) analysis (see Figure 1). The collective results suggested a hydrocarbon-based tar. Comparison with commercial products indicated that the coating was actually emulsified asphalt, used to seal driveways or roofs, etc. The material was transparent to X-rays.



**Figure 1 - Top Trace, “Paint”; Bottom Trace, Commercial Asphalt**

[Editor’s Notes: This technique was first reported in the October 23, 2003 issue of the *Drug Enforcement Report* (published by PaceCom Incorporated). According to the report, smugglers have used the coating in numerous drug smuggling efforts.]

\* \* \* \* \*

### **- INTELLIGENCE ALERT -**

#### **“STONERS ‘TAINTED TRUFFLE’” CANDY BARS SEIZED IN BECKHAM COUNTY, OKLAHOMA**

The Oklahoma State Bureau of Investigations Central Drug Lab (Oklahoma City, Oklahoma) recently received an unusual case that included exhibits of marijuana, methamphetamine, and what appeared at first glance to be an imitation “Snickers” brand candy bar with a wrapper labelled “STONERS Tainted Truffles” (see Photo 2, next page). The wrapper labelling also included a tiny marijuana leaf-based logo, and a consumer warning “For Medicinal Use Only”.

The exhibits had been mailed to Oklahoma from southern California (sending location not further specified), and were seized by a Drug Task Force officer in Beckham County, Oklahoma (a rural area in the western part of the state), in cooperation with the U.S. Postal Service. At the time of submission, it was unknown if the candy bar actually contained any controlled substances. The bar was similar in appearance, size, and apparent makeup to a regular Snickers candy bar (see Photo 3; dimensions 10 x 2.5 x 2.0 centimeters, total net mass 62.9 grams). Analysis by GC and GC/MS confirmed tetrahydrocannabinol (THC) (quantitation not performed). This was the first submission of this type of exhibit to the laboratory.



**Photo 2**



**Photo 3**

\* \* \* \* \*

### **- INTELLIGENCE ALERT -**

### **WOODEN PICTURE FRAMES CONTAINING COCAINE HCl IN MIAMI, FLORIDA**

The DEA Southeast Laboratory (Miami, Florida) recently received a submission consisting of seven brown, wooden picture frames which included plastic bags containing white powder hidden within internal cavities, suspected cocaine (see Photo 4). The frames (dimensions 24 x 18 x 1.5 centimeters) had been mailed via Federal Express, and were seized by the DEA Miami Field Division personnel at the U.S. Customs Foreign Mail Facility in Miami. Each frame had a different inscription in Spanish, for example “Para Alguien muy Especial” (“For Someone Very Special”). Analysis of the powder (total net weight 948.9 grams) by GC-FID, GC/MS, and IR confirmed 97 percent cocaine hydrochloride. This was the first submission of this type to the laboratory.



**Photo 4**



**- INTELLIGENCE ALERT -**

**CHRISTMAS TREE SKIRTS CONTAINING HEROIN  
IN NORTHERN NEW JERSEY**

The DEA Northeast Laboratory (New York, New York) recently received a submission from the Immigration and Customs Enforcement, Newark, New Jersey Office, consisting of a Christmas Tree Skirt (see Photo 5), suspected to contain heroin. The skirt (diameter approximately 36 inches) was initially seized at the U.S. Post Office's Foreign Mail Facility in Miami, Florida and was originally mailed from Colombia. It was submitted to the Northeast Laboratory after a controlled delivery to a northern New Jersey locale (exact location withheld). Upon examination, it was determined that the skirt contained a dark, clay-like substance concealed between the back lining and the embroidered surface layer, total net mass 431.7 grams. Analysis by GC-FID, GC/MS and FT-IR/Microscope confirmed 71 percent heroin hydrochloride, cut with lidocaine. This was the laboratory's first encounter with this smuggling technique.



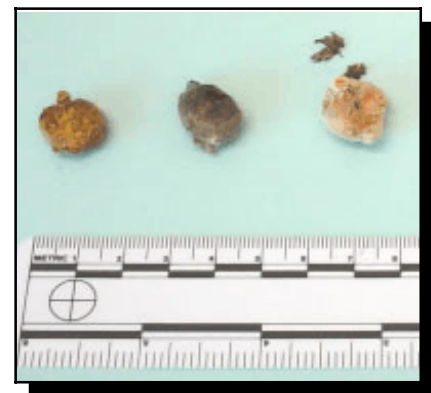
**Photo 5**

\* \* \* \* \*

**- INTELLIGENCE ALERT -**

**BODY-PACKED MARIJUANA AT THE FEDERAL PENITENTIARY  
IN FORREST CITY, ARKANSAS**

The DEA South Central Laboratory (Dallas, Texas) recently received a submission of seven body-passed balloons containing suspected marijuana (see Photo 6). The exhibits were submitted by the Federal Bureau of Investigation, and were seized from an inmate incarcerated at the Federal Penitentiary at Forrest City, Arkansas. The inmate was observed eating suspicious items provided to him by his wife during a visitation. The items were eventually recovered from the defendant after he was isolated in a dry cell and placed under observation. Analysis of the plant material from the balloons (total net mass 3.9 grams) by microscopic examination, modified Duquenois-Levine color test, and GC/MS confirmed tetrahydrocannabinol and marijuana (THC content not quantitated). This was the first exhibit of this type submitted to the Laboratory.



**Photo 6**



**- INTELLIGENCE ALERT -**

**METHAMPHETAMINE COLORED WITH SIDEWALK CHALK  
IN MADERA COUNTY, CALIFORNIA**

[From the NDIC *Narcotics Digest Weekly* 2004;3(2):1  
Unclassified, Reprinted with Permission.]

Officials with the Madera County (CA) Narcotic Enforcement Team (MADNET) report that methamphetamine producers have begun using colored sidewalk chalk to color powdered methamphetamine. Some Mexican nationals are operating large methamphetamine laboratories in the Central Valley area of California. They produce powdered methamphetamine, transport it to stash sites, cut it with methylsulfonylmethane (MSM), color it by mixing the drug with ground-up colored chalk, and package it for distribution. They use blue, green, red, and yellow chalk to color the methamphetamine, often providing certain colors of methamphetamine to specific distributors. MADNET officials believe that these traffickers color methamphetamine to appeal to methamphetamine users who believe that certain colors have a higher purity than other colors.

NDIC Comment: It is unusual for Mexican nationals operating large methamphetamine laboratories to color the methamphetamine they produce. Mexican nationals who operate large methamphetamine laboratories typically do not deliberately color the drug; some independent methamphetamine producers who operate small laboratories do, however, color their methamphetamine. Colored methamphetamine typically is the result of using pseudoephedrine tablets with a colored coating (usually red) and not washing the color out. However, methamphetamine has been colored by adding food coloring. The use of colored chalk is a new method of coloring methamphetamine in the Central Valley area and is not typical of large methamphetamine laboratories.

[Editor's Additional Notes: The use of chalk as a cutting agent would be extremely hazardous to users who inject methamphetamine. Intravenous injection of particulate matter can cause blockages of smaller blood vessels, leading to ischemia (mechanical obstruction of blood flow), cell death, and gangrene.]

\* \* \* \* \*

**- INTELLIGENCE BRIEF -**

**PARA-METHOXYAMPHETAMINE AND PARA-METHOXYMETHAMPHETAMINE  
IN CECIL COUNTY, MARYLAND**

The Maryland State Police Forensic Sciences Division (Pikesville, Maryland) recently received a submission of forty-two tablets and fifty-eight gel capsules, suspected Ecstasy. The exhibits were seized pursuant to a warrant search at an apartment in Cecil County by the North East Drug Task Force (consisting of members of the Maryland State Police and the Cecil County's Sheriff's Office). The tablets were round (3/8ths inch diameter), light purple, fragile, and had no

logo (see Photo 7); total net mass not determined. Analysis by color testing (Marquis - red), FT-IR and GC/MS, however, indicated not MDMA but rather *para*-methoxymethamphetamine (PMMA), cut with aspirin and ephedrine (aspirin and ephedrine not confirmed, quantitation of PMMA not performed). The capsules were clear, had no logo or markings, contained an off-white powder, and weighed approximately 100 milligrams each (see Photo 8). Analysis of the powder by UV, FT-IR, and GC/MS, however, indicated not MDMA but rather *para*-methoxyamphetamine (PMA) (quantitation not performed). These exhibits are believed to be the Laboratory's first encounters with both drugs.



**Photo 7**



**Photo 8**

\* \* \* \* \*

**- INTELLIGENCE BRIEF -**

**ECSTASY MIMIC TABLETS CONTAINING METHAMPHETAMINE  
AND LIDOCAINE IN ERIE, PENNSYLVANIA**

The Pennsylvania State Police Erie Regional Laboratory (Erie, Pennsylvania) recently received a polydrug submission including plant material (identified as marijuana), white powder (identified as cocaine), and 14 pink tablets embossed with a number three on one side, suspected Ecstasy (see Photo 9). The exhibits were seized in Milcreek Township by the Milcreek Township Police Department. The tablets (total net mass 3.7 grams) were 8 millimeters in diameter and unmarked on the reverse face; analysis by color testing (Marquis), FT-IR, and GC/MS indicated not MDMA but rather a mixture of methamphetamine and lidocaine (quantitation not performed). This was the first submission of these type tablets to the laboratory.



**Photo 9**

**- INTELLIGENCE BRIEF -**

**HASHISH OIL LABORATORY IN LAYTONVILLE, CALIFORNIA**

[From the NDIC *Narcotics Digest Weekly* 2003;2(51):2  
Unclassified, Reprinted with Permission.]

Investigators with the Mendocino County Major Crimes Task Force reported that on November 18, 2003, deputies with the Mendocino County Sheriff's Department discovered that three individuals were producing hashish oil in a Laytonville motel. Deputies responded to the motel after receiving a report of an explosion and fire. Upon their arrival, they found three individuals who had received severe burns when a clandestine laboratory they were operating in one of the rooms exploded. After securing the scene, the deputies called the task force to assist in dismantling the laboratory. In the room task force investigators discovered 93 full and 44 empty butane gas canisters and PVC pipes that were capped on one end. Each end cap had a hole drilled in it, and the pipes were filled with wet marijuana. Investigators also found 40 pounds of low quality "shake" (marijuana leaves, particularly plant trimmings, and powdery remnants of marijuana at the bottom of a bag) and a recipe for producing hashish oil obtained from the Internet. Although the individuals took precautions to avoid igniting the butane gas by putting duct tape over the outlets, inspectors believe that the explosion occurred when one of the individuals attempted to boil water by lighting a propane canister under a heating element. Investigators also found a bloody trail leading to another room in the motel. After obtaining a search warrant for the second room, investigators found additional laboratory materials as well as evidence that at least one other co-conspirator had fled the scene after the explosion. The three individuals burned in the incident were hospitalized in serious condition. Criminal charges against the individuals are pending.

NDIC Comment: Hashish oil is not widely abused in the United States, and discoveries of hashish oil laboratories are limited. Although constructing a laboratory to produce hashish oil is relatively simple, they are particularly dangerous to operate because the production process usually requires the heating of extremely flammable solvents.

\* \* \* \* \*

**- INTELLIGENCE BRIEF -**

**WAMEGO (KANSAS) LSD LABORATORY - FINALE**

[From the NDIC *Narcotics Digest Weekly* 2003;2(52):3  
Unclassified, Reprinted with Permission.]

On November 25, 2003, the U.S. Attorney's Office for the District of Kansas announced that two men had been sentenced to prison after being convicted for conspiring to operate the largest complete LSD (lysergic acid diethylamide) laboratory ever seized by the DEA. One man was sentenced to life and the other was sentenced to 30 years, both without the possibility of parole. In March 2003, a federal jury found the two California residents guilty of conspiracy to

manufacture and distribute LSD and possession with the intent to distribute LSD. During the 11-week trial, prosecutors entered evidence showing that in October 2000 law enforcement authorities received information regarding an LSD laboratory located in a decommissioned missile silo in Wamego, Kansas. DEA agents obtained and executed a search warrant for the silo and discovered a nonoperational LSD laboratory. The agents also discovered 41.3 kilograms of LSD, 23.6 kilograms of iso-LSD (a by-product of LSD production), 97.5 kilograms of lysergic acid (a chemical used in LSD production), and 19 kilograms of ergocristine (an LSD precursor). Authorities guarded the evidence found at the silo and maintained surveillance on the site until early November 2000 when the defendants returned to move the laboratory to another location. The Kansas Highway Patrol stopped the men as they left the site; one defendant drove a rental truck containing the laboratory components, and the other drove an automobile. The defendant in the rental truck was arrested, and the other defendant fled on foot. He was apprehended and arrested the following day at a farm in Wamego. During a subsequent investigation, agents learned that although chemicals needed to produce LSD had been found in the missile silo, the seized LSD had actually been produced at another site.

NDIC Comment: The defendants in this case were responsible for the production of a significant amount of LSD that was widely distributed over several years. Investigators believe that the defendants previously were involved with two other complete LSD laboratories that DEA seized in 1996 (Oregon) and 1998 (California). Investigators also believe that between 1997 and 2000 the defendants used the equipment seized in October 2000 to operate LSD laboratories in Aspen (CO), Santa Fe (NM), and Carneiro (KS) before moving it to the missile silo in Wamego during July 2000. While authorities believe that no LSD was produced at the Wamego location, they estimate that the defendants used the laboratory equipment to produce approximately 10 million dosage units (2.2 pounds) of LSD every 5 weeks while at the Santa Fe location and comparable amounts while at the Carneiro location. The men sold the LSD to distributors in San Francisco and California. Additionally, investigators believe that some of the LSD was shipped overseas to the Netherlands via couriers on commercial airlines.

\* \* \* \* \*

## **Selected Intelligence Brief**

### **Identification of Iodine and Red Phosphorus**

**Scott R. Oulton**

DEA Southwest Laboratory  
2815 Scott Street  
Vista, CA 92081

[Unclassified; Reprinted With Permission]

Iodine and red phosphorus are listed chemicals that may be received by forensic laboratories in connection with clandestine laboratory investigations. As such, these chemicals should be identified and reported as needed. There have been various inquiries to the DEA Office of Forensic Sciences with respect to how each laboratory is analyzing iodine and red phosphorus samples. Although not comprehensive, a summary of methods used by the laboratories to identify iodine and red phosphorus is presented below.

#### **Iodine**

##### **Presumptive Screening Tests (1)**

- \* Visual: Iodine is a metallic solid.
- \* Potassium-iodide test strip: Moistened and waved over iodine turns purple.
- \* Iodine in chloroform yields a purple color. This can be decolorized with a thiosulfate solution.
- \* Iodine mixed with red phosphorus and water will yield hydriodic acid; this solution reacted with silver nitrate yields a yellow precipitate. The pH will also be acidic.
- \* Iodine added to a starch solution turns blue.

##### **Qualitative Analysis**

- \* Iodine reacted with ethanol or acetone and sodium hydroxide forms iodoform. A GC/MS, GC/IR or FTIR of iodoform can be obtained. (1)
- \* Iodine can be reacted with red phosphorus and water to form hydriodic and phosphoric acids. FTIR's of ephedrine hydriodide and ephedrine phosphate can be obtained by reacting the acid product with ephedrine base. (2)
- \* A GC/MS of iodine can be obtained, produces fragments at m/z 127 and 254. (1)
- \* Iodine can be reacted with benzene, sulfuric and nitric acids to form iodobenzene. This can be analyzed by GC/MS. (3)
- \* Iodine can be reacted with ethanol and red phosphorus to form ethyl iodide. This can be analyzed by GC/MS. (3)
- \* Iodine in various solvents (water, methanol, chloroform) exhibits a different absorbency max in visible ranges utilizing UV spectrophotometry.
- \* Iodine can be reacted with red phosphorus and water to form hydriodic and phosphoric acids. FTIR's of ammonium hydriodide and ammonium hydrogen phosphate can be obtained by reacting the acid product with ammonia. (4)

## Red Phosphorus

### Presumptive Screening Tests (1)

- \* Visual: Red phosphorus is a red powder.
- \* Red phosphorus ignites with a flame and burns with a white smoke.
- \* Use of commercial inorganic phosphorus test kit (Sigma, Molybdic acid based).
- \* Red phosphorus mixed with iodine and water will yield hydriodic acid, this solution reacted with silver nitrate yields a yellow precipitate. The pH will also be acidic.
- \* Red phosphorus can be oxidized by heating with 1:1 nitric and hydrochloric acids or by burning. The oxidized product can be tested in the following manner: 1) Oxidized sample in water then treated with barium chloride yields a white precipitate; and 2) Oxidized sample mixed with ammonium molybdate yields unique crystals observed under the microscope. (5)

### Qualitative Analysis

- \* Red phosphorus can be reacted with sodium hydroxide in a vial to form phosphine, then GC/IR headspace can be obtained.
- \* Red phosphorus can be reacted with iodine and water to form hydriodic and phosphoric acids. FTIR's of ephedrine hydriodide and ephedrine phosphate can be obtained by reacting the acid product with ephedrine base. (2)
- \* Red phosphorus can be reacted with iodine and water to form hydriodic and phosphoric acids. FTIR's of ammonium hydriodide and ammonium hydrogen phosphate can be obtained by reacting the acid product with ammonia. (4)
- \* Red phosphorus can be converted to white phosphorus with heat, then GC/MS can be obtained. (6)

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- 2003;33(4):597. [Editor's Notes: Presents an HPLC method (using first derivative spectrophotometric detection) for analysis of the title compounds in pharmaceuticals. Contact: MM Mabrouck, Tanta Univ, Fac Pharm, Dept Pharmaceut Analyt Chem, Tanta, Egypt.]
3. Pitts SJ, Thomson CI. **Analysis and classification of common vegetable oils.** Journal of Forensic Sciences 2003;48(6):1293. [Editor's Notes: Presents methods of analysis for canola, corn, olive, peanut, safflower, soybean, and sunflower oils. (Although not stated, this study may also have value in the analysis of preparations of steroids in oils.) Contact: R.C.M.P. Forensic Laboratory, Edmonton, AB T5V 1B7, Can.]
  4. Altria KD, Elder D. **Overview of the status and applications of capillary electrophoresis to the analysis of small molecules.** Journal of Chromatography, A 2003;1023(1):1. [Editor's Notes: A review of the literature, 1999 - 2002, including forensic applications (not specified in abstract). Contact: New Frontiers Science Park, GSK R&D, Pharmaceutical Development, Product Line Extension Department, Third Avenue, Harlow, Essex CM19 5AW.]
  5. Balou S, Goodpaster JV, MacCrehan W, Reeder D, Eds. **Forensic analysis.** In: Anal. Bioanal Chem 2003;376(8). Springer-Verlag, Heidelberg, Germany, 2003. [Editor's Notes: No abstract or contact information was provided.]
  6. Nakazawa N. **Analysis of methamphetamine and amphetamine in wiped samples from the surface of the palms of methamphetamine abusers.** Kagaku Keisatsu Kenkyusho Hokoku, Hokagaku-hen 2003;55(1):23. [Editor's Notes: Analysis was done by GC/MS. This article was written in Japanese. Contact: Sci. Crime Detection Lab., Yamanashi Prefect. Police Headquarters, Yamanashi, Japan 406-0036.]
  7. Smyth WF. **Electrospray ionisation mass spectrometric behaviour of selected drugs and their metabolites.** Anal. Chem. Acta 2003;492:1. [Editor's Notes: Presents a review of the use of HPLC-ESI-MS for the analysis of selected (not specified) drugs and their metabolites. Contact: School of Biomedical Sciences, University of Ulster, Coleraine, Co. Derry, BT52 1SA, UK.]
  8. Matsuda K, Nakatoh S, Minatogawa Y, Suzuki K, Kimura H, Yamamoto S, Kohama A, Tohyama K. **Development of a GC/MS library for analyzing pesticides and drugs.** Rinsho Byori 2003;51(10):63871009-B963. [Editor's Notes: Presents the development of a library with 20 pesticides and herbicides, and 57 drugs. This article is written in Japanese. Contact: Dep. Clin. Lab., Kawasaki Med. Sch. Hosp., Kurashiki, Japan 701-0192.]

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## NEW EMAIL ADDRESSES NEEDED

The email addresses for the following organizations (next page) have returned rejection notices to the Microgram Editor for the past three issues of *Microgram Bulletin*, and will therefore be dropped from the subscription list unless a corrected email address is provided by the end of February 2004. Note that the errors include anti-spamming comments, mailbox full messages, and user not found or user unknown messages. The Editor requests your assistance in contacting these organizations, determining if they wish to remain on the *Microgram* subscription e-net, and if so asking them to provide a valid email address to the [microgram\\_editor@mailsnare.net](mailto:microgram_editor@mailsnare.net) address.

Israeli Police - Office of the Chief Superintendent - Israel

Laurent Rivier Scientific Consulting - Switzerland

Missouri - MSSC Regional Crime Laboratory - Joplin

Naval Criminal Investigative Service (NCIS) - San Diego Regional Laboratory

U.S. Food and Drug Administration - Northeast Regional Laboratory (Jamaica, New York)

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**The following organizations (listed last month) were dropped on 1/31/04:**

Alabama Department of Forensic Sciences - Birmingham Laboratory

Bureau of Alcohol, Tobacco, and Firearms Laboratory - San Francisco

Massachusetts Department of Public Safety - Jamaica Plains

Ocean City (Maryland) Police Department Laboratory

Pennsylvania Office of the Attorney General

U.S. Food and Drug Administration - Arkansas Regional Laboratory

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**THE DEA FY - 2004 STATE AND LOCAL  
FORENSIC CHEMISTS SEMINAR SCHEDULE**

The remaining FY - 2004 schedule for the DEA's State and Local Forensic Chemists Seminar is as follows:

April 19 - 23, 2004

June 14 - 18, 2004

September 20 - 24, 2004

Note that the school is open only to forensic chemists working for law enforcement agencies, and is intended for chemists who have completed their agency's internal training program and have also been working on the bench for at least one year. There is no tuition charge for this course. The course is held at the AmeriSuites Hotel in Sterling, Virginia (near the Washington/Dulles International Airport). A copy of the application form is appended onto the October 2003 issue of *Microgram Bulletin*, and should be mailed to the Special Testing and Research Laboratory (Attention: Pam Smith or Jennifer Kerlavage) at: 22624 Dulles Summit Court, Dulles, VA 20166. For additional information, call 703 668-3337.

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## EMPLOYMENT OPPORTUNITIES

### 1. Virginia Department of Criminal Justice Services

(Third and Final Posting)

**Position:** Forensic Scientist II (Controlled Substance Examiners) (Two Positions)

**Location:** Division of Forensic Science, Eastern Laboratory, Norfolk, VA

**Salary:** \$39,901 - \$65,540

**Application Deadline:** Open Until Filled

The Department of Criminal Justice Services is seeking two qualified individuals to perform forensic chemical analyses of suspected controlled substances in the Division of Forensic Science, Eastern Laboratory.

**Duties:** Incumbents will: 1) Use current state-of-the-art methodologies and instrumentation to analyze controlled substances; 2) Prepare Certificates of Analyses on findings for use by the criminal justice system; and 3) Testify in court as a qualified expert for the Commonwealth at criminal proceedings as to the results of laboratory findings. Position requires occasional overnight travel. Employee will provide own transportation as required.

**General Requirements:** Knowledge of basic theoretical principles and applications of the instrumentation and methodologies used to analyze controlled substances required. Knowledge of laboratory safety procedures; quality assurance/quality control and laboratory practices; instrumental analysis (GC, GC/MS, FTIR, UV) and experience in forensic drug analysis required. Successful completion of a documented training program and/or demonstration of competency is required. Experience presenting testimony in a court of law, as an expert witness is preferred. Must be able to analyze data, develop sound conclusions, maintain accurate records, and analyze, and solve technical problems. Ability to communicate effectively orally and in writing required. A baccalaureate degree in chemistry or other related science with sufficient chemistry courses is required; graduate degree is preferred. Valid driver's license and/or other means of reliable transportation required.

**Application Procedure:** Applicants must submit a state application (#10-012). Applications may be mailed to the Department of Criminal Justice Services, 805 East Broad Street, 10th Floor, Richmond, VA 23219, ATTN: Human Resource Office; emailed to [gcolburn@dcjs.state.va.us](mailto:gcolburn@dcjs.state.va.us) or faxed to 804-786-6484. State application forms may be obtained by calling (804) 786-4246 or by downloading the form from the employment section of the DCJS web page at [www.dcjs.org](http://www.dcjs.org). For assistance, call Gene Colburn at (804) 786-6925.

Notes: Selected candidates must provide a DNA sample via a buccal swab (saliva sample), be fingerprinted and pass a security background check. Equal Opportunity Employer.

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### 2. Broward County Sheriff's Office (BSO)

(First Posting)

**Position:** Crime Laboratory Manager

**Location:** Ft. Lauderdale, Florida

**Salary Range:** To Be Determined.

**Application Deadline:** Open Until Filled

**Duties:** This position directs, administers and manages all forensic services functions for the BSO (a 6,100 member department located in Ft. Lauderdale). Critical functions under charge include the Crime Laboratory, Automated Fingerprint Identification System (AFIS), and Latent Identification. Employees in this classification maintain responsibility for the direction, and management of personnel engaged in latent and ten-print identification, audio/video enhancements, quality control/quality assurance, DNA analysis, firearms and tool mark identification, forensic chemistry, questioned documents examination, and trace evidence analysis.

**Qualifications:** A Master's degree in chemistry, biology, or another physical science is required; a Ph.D. is preferred. The position also requires ten years experience that includes advanced forensic chemistry, biology or criminalistics preferably in a large national, state or regional laboratory. Thorough knowledge of DNA processing and American Society of Crime Laboratory Directors (ASCLD) certification required; certification by the American Board of Criminalistics (ABC) preferred. Experience in a managerial capacity with responsibility for administrative aspects of the work strongly desired.

**Application Procedures:** You may view a detailed job description, download an application or apply on-line at: [www.sheriff.org](http://www.sheriff.org). A completed application and accompanying resume will also be accepted by mail: Broward Sheriff's Office, Human Resources Bureau, 2601 W. Broward Blvd., Fort Lauderdale, FL 33312.

EOE M/F/D/V DFWP

# Computer Corner

Digital Evidence - Trends

## #179

by Michael J. Phelan  
DEA Digital Evidence  
Laboratory

An article in your local newspaper on January 1st undoubtedly contained an annual New Year's article or column entitled: "What's In and What's Out". The reading of this column in my local paper caused me to reflect on what's "in" and "out" in the domain of digital evidence forensics. I think it is important to reflect periodically on how things are changing, in order to assess the trends in digital evidence technologies and evidence examination methodologies. The rapid changes in digital evidence forensics can be far reaching, and can affect laboratory equipment and software procurement strategies, design of standard operating procedures, and development of examiner training requirements.

My list for this year was surprisingly large. Much has changed, or is in the process of significantly changing.

### End of DOS

DOS based computer evidence examination tools are "out". GUI based tools using the Microsoft Windows 2000 or XP platforms are "in". DOS based forensics tools are just too slow to process modern high capacity hard drives. However, you still need to keep your DOS operating system software and DOS forensic tools handy, in case you ever have to access

your archived files.

### Write Blockers

Software-based write blocking technology is "out" and hardware-based write blocking technology is "in", at least in the case of Microsoft-based operating systems. Unix operating systems are still best protected from deleterious change by using the native "read only" commands embedded in all Unix systems.

### Evidence Copying

Evidence copying using sector-by-sector copying (physical data acquisition) techniques of entire hard drives is "out", and copying techniques involving selected files, data folders, or hard drive partitions (logical data acquisition) is "in". The volume of information now maintained on many business computers or computer networks has become enormous. Physical data acquisition is simply not practical when large servers, computer networks, or data farms/warehouses are encountered.

### Evidence Storage Format

Evidence data acquisition involving the duplication of hard drive data is "out". Copying data into "image" files (consisting of files with all of the hard drive data and formatting structure), that are easily mounted as virtual drives (no

hardware interface issues), are "in". Use of image file formats saves examiner processing time by eliminating hardware complexity problems and simplifying hard drive format access methods.

### External Media

External storage media technology continues to rapidly change, and maintaining the appropriate hardware "reader devices" is a constant challenge. Previously mainstream technologies such as floppy diskettes or Iomega Jaz and Zip cartridges are becoming obsolete ("out"), while replacement technologies such as CD's, thumb drives, memory sticks, and DVD's are "in". Surprisingly, however, tape technology continues to play an important role in data backup. In addition, acquiring and maintaining a robust collection of PDA docking (recharging) cradles is becoming essential to laboratory operations.

### Potential Probative Information Recovery

The nature of digital communications is changing from file transfers containing documents or e-mails, to web-based communications containing web-based e-mail or e-commerce transactions. The impact of these changes on digital forensics is significant. Extensive data recovery



involving traditional techniques, such as active file browsing or erased file recovery, is diminishing (on the way “out”), and processing (carving) of hard drives for non-file keystroke data that is stored on the hard drive as unallocated clusters (i.e., in “free space”) or in the “swap file”, is increasing (“in”).

### **Evidence Integrity**

The technology used to validate copies of the original evidence has significantly evolved. The use of data packet communication algorithms, commonly known as a Cyclic Redundancy Check (CRC), is “out”, and global hard drive or file data integrity checks, known as hash algorithms, are “in”. Hash techniques such as MD-5 have a higher statistical probability calculation of certainty than a CRC check. The purpose of the CRC or hash check is to assess (within a certain degree of statistical probability) that a digital file copy containing binary data is the same as the original file from which it was copied. Such calculations are usually expressed as one in 28, 216, 224, or 264 possibilities that two different binary data sets (such as a file, partition, or hard drive) could have the same hash value. Larger hash value calculations increase the certainty of estimating the uniqueness of data sets.

### **Forensic Software Architecture**

Standalone forensic tools are “out”, and multi-functional software examination software suites are “in”. The integration of multiple digital forensic

examination tasks such as imaging, browsing, keyword searching, and carving, in one unified software program, has simplified laboratory operations by making it easier to conduct examiner training, coordinate software upgrades and validate the examination software. The integrated tools enhance examiner proficiency by enabling the user to utilize one common set of software commands to process a wide variety of hard drive formats (FAT-32, NTFS, HPS, etc.).

### **Legal**

On-site copying of evidence at businesses and professional offices is “in”, and physical removal of the computers to a digital evidence laboratory is “out”. Courts are becoming more reluctant to authorize removal of computers, especially in cases involving businesses where both licit and illicit records may be commingled. Having robust on-site backup equipment and software is essential to the effective operation of a digital evidence laboratory.

Questions or comments?  
e-mail: [mphehan@erols.com](mailto:mphehan@erols.com)

# Microgram

## *Bulletin*

**Published by:**

**The Drug Enforcement Administration  
Office of Forensic Sciences  
Washington, DC 20537**

The U.S. Attorney General has determined that the publication of this periodical is necessary in the transaction of the public business required by the Department of Justice. Information, instructions, and disclaimers are published in the January issues.

**VOL. XXXVII, NO. 3**

**MARCH 2004**

**- INTELLIGENCE ALERT -**

**HEROIN IN THE FOAM BACKING OF A WOODEN TRAY TABLE  
SEIZED IN MIAMI, FLORIDA**

The DEA Northeast Laboratory (New York, New York) recently received a multi-part submission consisting of a large, decorated, wooden coffee tray with fold-down legs, plus four pictures mounted on wood (see Photo 1, note the clear, one foot long ruler leaning against the back edge of the tray), suspected as containing heroin. The exhibits were initially seized by the Immigration and Customs Enforcement Service Miami, Florida Office from a Federal Express shipment (origin not reported), and were submitted to the laboratory after an attempted controlled delivery in the New York City area. The pictures did not contain any controlled substances; however, the tray contained a backing of yellow rubberized foam that field-tested



**Photo 1**

positive for heroin (see Photo 2). Analysis of the foam (total net mass 333.6 grams) by GC-FID, GC/MS, and FT-IR confirmed 86 percent heroin hydrochloride. The laboratory has previously received foam and rubberized mats containing heroin, but never before as part of a tray table.



**Photo 2**

[Editor's Notes: Previous "heroin foam" exhibits have all derived from South American processors. 86 percent heroin in a foam sample is unusually high, and suggests a possible breakthrough in this technology.]

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### **- INTELLIGENCE ALERT -**

#### **N-METHYLPYRROLIDINONE IN A GAMMA-HYDROXYBUTYRATE SOLUTION IN COPLEY, OHIO**

The DEA North Central Laboratory (Chicago, Illinois) recently received a clear liquid in a one pint, opaque plastic bottle, labelled: "DIR DRINK 1/4 CUP AFTER DINNER", suspected to be a solution of either *gamma*-hydroxybutyric acid (GHB) or sodium *gamma*-hydroxybutyrate ( $\text{Na}^+\text{GHB}^-$ ), total net volume 470 milliliters (see Photo 3). The exhibit was acquired in Copley, Ohio by the DEA Cleveland Resident Office (Copley is located just west of Akron). Analysis of the liquid by GC/MS, IR, and  $^1\text{H}$ -NMR (including COSY), however, indicated an aqueous solution containing a 2:1 mixture of  $\text{Na}^+\text{GHB}^-$  and N-methylpyrrolidinone (NMP, also known as N-methylpyrrolidone), an industrial solvent (not further quantitated). Isolation of NMP for formal identification was achieved by evaporation of the water followed by extraction of the residue with hexane. This was the first ever sample of NMP submitted to this laboratory.



**Photo 3**

[Editor's Notes: N-methylpyrrolidinone (NMP) is a so-called dipolar aprotic solvent. The Material Safety Data Sheet indicates that NMP is toxic, and that ingestion will cause nausea, vomiting, and irritation of the GI tract. Long-term effects are unknown; however, the unusual solvating properties of this solvent would suggest highly negative consequences for intentional ingestion, especially multiple times. It is unclear whether the production of this mixture was accidental or intentional. A quick review of the major drug abuse websites indicates (as of late January 2004) very little on NMP. However, there is some low-level experimentation occurring with *gamma*-aminobutyric acid (GABA), and comments indicate that the users believe that GABA will form GHB *in vivo*. This suggests that

the producers may believe that NMP will form N-methyl-GABA *in vivo*. It is unknown whether this postulation is accurate, or if accurate whether N-methyl-GABA would have any pharmacological similarity to GHB. Regardless, these reports suggest that suspected GHB or GBL solutions should also be screened for NMP whenever anomalous results are obtained.)

\* \* \* \* \*

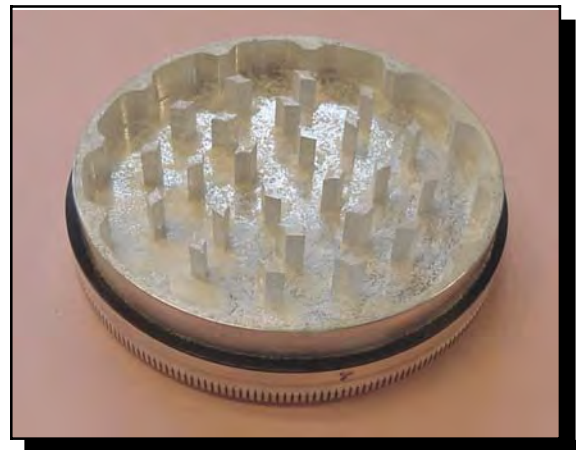
### **- INTELLIGENCE ALERT -**

#### **“COCAINE GRINDER” IN FAIRBANKS, ALASKA**

The DEA Western Laboratory (San Francisco, California) recently received a small, metal "herb grinder" contaminated with a white residue, suspected cocaine (see Photo 4). The exhibit was seized at a residence in Fairbanks, Alaska by agents from the DEA Fairbanks Post of Duty and the Alaskan State Police. The grinder was approximately 2 5/8 inches in diameter and 1 inch tall. When opened, each half was studded with diamond-shaped metal teeth (see Photo 5). When closed and twisted, the teeth shred or grind whatever substance is in the container. An Internet search revealed that similar products are sold as "herb grinders." Analysis of the residue by color testing, IR, and GC/MS confirmed cocaine hydrochloride (not quantitated). This is the first submission of this type to the laboratory.



**Photo 4**



**Photo 5**

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### **- INTELLIGENCE ALERT -**

#### **CRYSTAL METHAMPHETAMINE CONCEALED IN BATTERIES**

[From the NDIC *Narcotics Digest Weekly* 2004;3(4):2  
Unclassified, Reprinted with Permission.]

In two separate incidents that occurred in November and December 2003, law enforcement personnel in Idaho and Utah seized crystal methamphetamine concealed in modified 12-volt

automobile batteries. In November 2003 Ada County Metro Narcotics Unit (ID) authorities executed a search warrant that resulted in the seizure of 4 pounds of crystal methamphetamine, a quarter-pound of cocaine, and \$20,000 concealed inside a 12-volt automobile battery. When the officers inspected the battery, they located a small pinhole on the side of its case and found that the top was loose, indicating that the battery may have been modified. The officers discovered that they could access a hidden compartment in the battery by sliding the end of a paper clip or similar object into the pinhole on the side of the battery case, triggering a solenoid switch and releasing the top of the battery. Similarly, on December 2, 2003, Utah Highway Patrol troopers in Beaver County seized 3 pounds of crystal methamphetamine concealed in a 12-volt automobile battery during a routine traffic stop. The battery also had a small pinhole in the side of its case and loose terminals.

NDIC Comment: The use of vehicle batteries to conceal drugs and currency is not a new technique; however, in the past most seizures have involved heroin or powder cocaine. In addition, batteries previously seized with false compartments typically were not functional; however, in both seizures noted above the batteries contained a smaller 6-volt motorcycle battery that provided enough power to start the vehicles. State law enforcement officials in Utah suspect that more of these specially modified batteries have been fabricated and that Mexican criminal groups in the Northwest and West are using them to transport crystal methamphetamine and illicit drug proceeds.

[Editor's Notes: A very similar exhibit was reported in the January 2004 issue of *Microgram Bulletin* (including photos). In that case, the battery had been buried inside a tub of joint compound, and contained about 5.5 kilograms of cocaine hydrochloride. That battery also had a smaller battery inside that provided power to the terminals.]

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## **- INTELLIGENCE BRIEF -**

### **2C-I TABLETS IN THE BALEARIC ISLANDS (SPAIN)**

The Laboratory of Drugs in the Balearic Islands (Spain), recently, received twelve separate submissions of white tablets with displaying an "i" logo on one side and single score on the opposite face, diameter and width 6 x 3 millimeters, suspected Ecstasy (photos not available). The tablets (numbering 43 in total, averaging 154 milligrams each) were seized by the Guardia Civil from various visitors and vacationers on Ibiza island. Analysis by color testing (Marquis - green), GC-FID, and GC/MS, however, indicated not MDMA but rather 2,5-dimethoxy-4-iodophenethylamine (2C-I; not quantitated). This is the first time that either 2C-I or "i" logo tablets have been encountered at the laboratory.

[Editor's Notes: A short Intelligence Brief on 2C-I tablets from the Europol *Drugs Intelligence Bulletin* was reprinted in the May 2003 issue of *Microgram Bulletin*; this Brief includes photos of "i" logo tablets of 2C-I that appear to be the same as those described above). The following comments (next page) were taken from the January 2004 issue of the *Forensic Drug Abuse Advisor* (unclassified; reprinted with permission):



Another new product, which originated in California, was synthesized by famed chemist Alexander Shulgin. It is called 2C-I (2,5-dimethoxy-4-iodophenethylamine, also known as 4-iodo-2,5-dimethoxyphenethylamine, [2,5-dimethoxy-4-iodophenyl]-2-aminoethane and 4-iodo-2,5-dimethoxyphenethylazan). Europol, the drug arm of Interpol, reports that 2C-I first appeared in Denmark in the spring of 2002. Seizures have also been reported in Germany, Sweden and the UK. In addition, according to a report in the DEA's journal, *Microgram*, 2C-I has also been seized in Toronto and Milwaukee.

Other than the fact that Shulgin created it (details can be found in his book "PIHKAL"), not much else is known. The dose is said to be between 15-20 milligrams, the time to onset is at least one-half hour, and it is thought to be very long acting, perhaps even exerting its effects the next day. The delay of the drug's effect may cause some users to take additional doses or other drugs which may increase the risk of toxicity or accidental over dosage. According to the United Nations, at the present time "there are no animal or human data concerning general toxicity, reproductive toxicity, neurotoxicity or the mutagenicity and carcinogenic potential of 2C-I."

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## - INTELLIGENCE BRIEF

### FENTANYL LOZENGES IN TAMPA, FLORIDA

The Florida Department of Law Enforcement Tampa Crime Laboratory (Tampa, Florida) recently received a polydrug submission that included eight boxes of ACTIQ brand oral transmucosal fentanyl citrate, 1600 micrograms per lozenge. The exhibits had been seized by the Hillsborough County Sheriff's Department from a residence in Hillsborough County (near Tampa), pursuant to an investigation of a case of prescription drug fraud. Seven of the boxes were unopened and were labelled as containing 30 dosage units each. Analysis of one lozenge from the opened box (see Photo 6) by GC and GC/MS confirmed fentanyl (not quantitated). A second exhibit in the case included three manufacturer's bottles containing a total of 240 tablets marked WATSON 540 (photo not provided). Analysis by GC and GC/MS confirmed hydrocodone (not quantitated). This is the first time fentanyl lozenges have been encountered at the laboratory.



Photo 6

[Editor's Notes: Commercial Watson 540 tablets contain 10 milligrams of hydrocodone bitartrate and 500 milligrams of acetaminophen per tablet.]

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**- INTELLIGENCE BRIEF -**

**LSD LABORATORY IN HARRISONBURG, VIRGINIA**

Chemists from the DEA Mid-Atlantic Laboratory (Largo, Maryland) recently participated in the seizure of a boxed polydrug laboratory in Harrisonburg, Virginia, suspected to be for production of methamphetamine, MDMA, and LSD. The storage boxes were seized from an apartment by agents from the DEA Winchester (Virginia) Post of Duty. The exhibits included a variety of chemicals and glassware, including numerous petri dishes and plastic cups containing fungal growth (see Photos 7 and 8). Analysis and evaluation indicated that the clandestine laboratory operator (a biology student at a local University) was attempting to produce lysergic acid from an uncommonly used strain of ergot fungus, *Claviceps Paspali*, and appeared to be in the early stages of determining optimal growth media and conditions. The chemicals, extensive literature, and notes found at the site confirmed that the operator was following the lysergic acid, N,N-carboxyldiimidazole, diethylamine synthesis (production routes for methamphetamine and MDMA not specified). All necessary chemicals needed for the syntheses of all three substances were present; however, no final products were recovered at the site. This was the first LSD laboratory encountered by laboratory personnel.



**Photo 7**



**Photo 8**

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**- INTELLIGENCE BRIEF -**

**UNUSUAL “ICE” METHAMPHETAMINE LABORATORY SEIZED IN GUAM**

The DEA Southwest Laboratory (Vista, California) was recently involved in the seizure of an “Ice” methamphetamine laboratory in Guam. Methamphetamine HCl was being “iced out” via recrystallization from concentrated solutions in acetone and water. Unusually, the products were not all *d*-methamphetamine HCl, but rather *d*-, *l*-, *d,l*-, and non-racemic mixtures of *d*- and *l*-methamphetamine HCl. The finished products included 889 grams of *l*-methamphetamine HCl (97%), 58 grams of *d*-methamphetamine HCl (96%), and three exhibits (5 grams each) of *d,l*-methamphetamine HCl (98%). A nearly colorless liquid found in the refrigerator consisted of 3.2 liters of *l*-methamphetamine HCl, at a concentration of 948 milligrams/milliliter. Two other

light brownish liquids on the stove each contained about 1.8 liters of non-racemic *d*- and *l*-methamphetamine HCl, each at a concentration of over 600 milligrams/milliliter. The ratios of the *l*-isomer to *d*-isomer in these two solutions was 60:40 and 80:20. [The isomeric ratios were determined by GC analysis of the TPC derivatives and direct analysis by CE with a cyclodextrin buffer.] The total weight of pure methamphetamine HCl in the lab was over 6.4 kilograms. Based on the unusual isomeric results, the methamphetamine being “iced up” obviously came from different sources or batches, or were derived from mixed isomer precursors.

[Editor’s Comments: “Ice” methamphetamine is legally defined as high purity (> 80 percent) *d*-methamphetamine HCl. The classic form of “Ice” is large, transparent or nearly transparent, colorless crystals. Over the past two years, however, submissions of *l*-, *d,l*-, and non-racemic mixtures of *d*- and *l*-methamphetamine HCl in similarly appearing crystals have dramatically increased. Although these exhibits look like “Ice” (and are often so termed), by definition they are not, and therefore they do not qualify for the higher penalties prescribed for “Ice” in Federal sentencing guidelines. This means that forensic chemists need to be judicious in their use of the term “Ice”, and also mandates isomer determination when apparent “Ice” is submitted.]

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## **- INTELLIGENCE BRIEF -**

### **ANALYSIS OF HEROIN FROM THE AUSTRALIAN SEIZURE OF A NORTH KOREAN CARGO VESSEL**

The DEA Special Testing and Research Laboratory (Dulles, Virginia) recently received 100 sample packets of white powder heroin from the DEA Country Office in Canberra, Australia. The samples were provided to the DEA by the Australian Federal Police, and were taken from a large shipment of heroin seized by the Australian authorities from a North Korean cargo vessel off the coast of Australia. That seizure consisted of 50 kilograms found on the vessel and another 75 kilograms that had already been off-loaded, and was of particular interest due to the long-suspected involvement of North Koreans in heroin production.

Standard alkaloid analysis of the exhibits determined that they contained heroin HCl and acetylcodeine HCl in varying ratios, that when combined totaled between 90 - 100 percent. The heroin purities ranged from 60 - 90 percent, while the acetylcodeine purities ranged from 10 - 30 percent. Some exhibits were also found to contain O6-monoacetylmorphine and noscapine; however, when present these compounds were at low levels - less than 1 percent. No adulterants or diluents were found in any of the exhibits.

All 100 exhibits were also subjected to detailed heroin signature analysis for determination of processing origin. All gave a final classification category of “Unknown” - that is, the signatures did not match any of the standard heroin profiles maintained by the Special Testing and Research Laboratory (those being: Southeast Asian (SEA), Southwest Asian (SWA), South American (SA), and Mexican (MEX)). Over 90 percent of all heroin exhibits submitted to the laboratory are classified as one of these four processing origins. The collective results indicate that the seized samples were not processed by any of the classic (known) methodologies.

## Selected Intelligence Brief

### Selected References (1992 - 2003) for Forensic Analysis of *gamma*-Hydroxybutyric Acid, *gamma*-Hydroxybutyrate, *gamma*-Butyrolactone, and Related Compounds

Analysis of *gamma*-hydroxybutyric acid (GHB) or *gamma*-hydroxybutyrate (GHB<sup>-</sup>): Review (1), overview (2,3), comprehensive analyses (4,5,6), by dual mode ion trap mobility spectrometry (7), by free zone CE with direct UV detection of GHB (8), by color testing (9,10), by FTIR and color testing (11), by GC/MS after extraction on a SPME fiber and derivatization with BSTFA (12), by ICP-atomic emission and MS (13), by IR (14), by IR using a 3-bounce diamond ATR element (15,16), by microcrystal testing with cupric nitrate/silver nitrate solution (17), by NMR (18,19), by SPME - HPLC/UV and SPME/HPLC/MS (20), and by SPME - GC/quadrupole ion trap spectrometry (21).

Analysis of *gamma*-hydroxybutyric acid (GHB) and *gamma*-butyrolactone (GBL): Interconversion studies (22,23,24,25,26), by CE and HPLC (27), by GC/MS with BSTFA derivatization (28), by GC/MS and H1-NMR (29), by HPLC (30), by HPLC/UV-Vis and HPLC/Thermospray MS (31), by IR (32), and *gamma*-butyrolactone in wine by GC/MS (33).

Analysis of *gamma*-hydroxybutyric acid (GHB), *gamma*-butyrolactone (GBL), 1,4-butanediol (BD), tetrahydrofuran (THF), and/or GHB/GBL analogs: Comprehensive analysis of BD (34), Overview and comprehensive analyses (35), overview of analysis of GHB, GBL, and BD (36), overview of GHB, GABA, and various analogs (37), by capillary electrochromatography (38), by CE (39), by HPLC using paired ion chromatography (40), detection in liquids by osmolality (41), and of various 2-alkyl-2-keto-*gamma*-butyrolactone derivatives by GC after chiral derivatization (42).

1. Clandestine Laboratory Investigating Chemists Association. Monograph: GHB. Fresno, CA:2000.\*
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\* Note: The *Journal of the Clandestine Laboratory Investigating Chemists Association* is a law enforcement restricted journal.

\* \* \* \* \*

## SELECTED REFERENCES

[Note: Selected references are a compilation of recent publications of presumed interest to forensic chemists. Unless otherwise stated, all listed citations are published in English. If available, the email address for the primary author is provided as the contact information. Listed mailing address information (which is sometimes cryptic or incomplete) exactly duplicates that provided by the abstracting services.]

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## NEW EMAIL ADDRESSES NEEDED

The email addresses for the following organizations have returned rejection notices to the Microgram Editor for the past three issues of *Microgram Bulletin*, and will therefore be dropped from the subscription list unless a corrected email address is provided by the end of March 2004. Note that the errors include anti-spamming comments, mailbox full messages, and user not found or user unknown messages. The Editor requests your assistance in contacting these organizations, determining if they wish to remain on the *Microgram* subscription e-net, and if so asking them to provide a valid email address to the [microgram\\_editor@mailsnare.net](mailto:microgram_editor@mailsnare.net) address.

Maine State Police Crime Laboratory - Augusta, Maine

National Institute of Toxicology - Sevilla, Spain

Oakland County Sheriff's Department, Pontiac, Michigan

Orange County Sheriff Coroner's Office - Santa Ana, California

South Bank University London - United Kingdom

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### The following organizations (listed last month) were dropped on 2/29/04:

Israeli Police - Office of the Chief Superintendent - Israel

U.S. Food and Drug Administration - Northeast Regional Laboratory (Jamaica, New York)

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## THE DEA FY - 2004 STATE AND LOCAL FORENSIC CHEMISTS SEMINAR SCHEDULE

The remaining FY - 2004 schedule for the DEA's State and Local Forensic Chemists Seminar is as follows (see next page):

April 19 - 23, 2004  
June 14 - 18, 2004  
September 20 - 24, 2004

Note that the school is open only to forensic chemists working for law enforcement agencies, and is intended for chemists who have completed their agency's internal training program and have also been working on the bench for at least one year. There is no tuition charge for this course. The course is held at the AmeriSuites Hotel in Sterling, Virginia (near the Washington/Dulles International Airport). A copy of the application form is appended onto the October 2003 issue of *Microgram Bulletin*, and should be mailed to the Special Testing and Research Laboratory (Attention: Pam Smith or Jennifer Kerlavage) at: 22624 Dulles Summit Court, Dulles, VA 20166. For additional information, call 703 668-3337.

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## EMPLOYMENT OPPORTUNITIES

### 1. Broward County Sheriff's Office (BSO)

(Second Posting)

**Position:** Crime Laboratory Manager

**Location:** Ft. Lauderdale, Florida

**Salary Range:** To Be Determined.

**Application Deadline:** Open Until Filled

**Duties:** This position directs, administers and manages all forensic services functions for the BSO (a 6,100 member department located in Ft. Lauderdale). Critical functions under charge include the Crime Laboratory, Automated Fingerprint Identification System (AFIS), and Latent Identification. Employees in this classification maintain responsibility for the direction, and management of personnel engaged in latent and ten-print identification, audio/video enhancements, quality control/quality assurance, DNA analysis, firearms and tool mark identification, forensic chemistry, questioned documents examination, and trace evidence analysis.

**Qualifications:** A Master's degree in chemistry, biology, or another physical science is required; a Ph.D. is preferred. The position also requires ten years experience that includes advanced forensic chemistry, biology or criminalistics preferably in a large national, state or regional laboratory. Thorough knowledge of DNA processing and American Society of Crime Laboratory Directors (ASCLD) certification required; certification by the American Board of Criminalistics (ABC) preferred. Experience in a managerial capacity with responsibility for administrative aspects of the work strongly desired.

**Application Procedures:** You may view a detailed job description, download an application or apply on-line at: [www.sheriff.org](http://www.sheriff.org). A completed application and accompanying resume will also be accepted by mail: Broward Sheriff's Office, Human Resources Bureau, 2601 W. Broward Blvd., Fort Lauderdale, FL 33312. EOE M/F/D/V DFWP

\* \* \* \* \*

### 2. Virginia Department of Criminal Justice Services

(First Posting)

**Position:** Forensic Scientist II

**Location:** Roanoke, VA

**Salary Range:** \$39,901 - \$65,540

**Application Deadline:** Open Until Filled

**Duties:** Incumbent will: 1) Use current state-of-the-art methodologies and instrumentation to analyze controlled substances; 2) Prepare Certificates of Analyses on findings for use by the criminal justice system; and 3) Testify in court as a qualified expert for the Commonwealth at criminal proceedings as to the results of laboratory findings. Position requires occasional overnight travel. Employee will provide own transportation as required.

**Qualifications:** Knowledge, skills and abilities: Knowledge of basic theoretical principles and applications of the instrumentation and methodologies used to analyze controlled substances required. Knowledge of laboratory safety procedures; quality assurance/quality control and laboratory practices; instrumental analysis (GC, GC/MS, FTIR, UV) and experience in forensic drug analysis required. Successful completion of a documented training program and/or demonstration of competency is required. Experience presenting testimony in a court of law, as an expert witness is preferred. Must be able to analyze data,

develop sound conclusions, maintain accurate records, and analyze, and solve technical problems. Ability to communicate effectively orally and in writing required. A baccalaureate degree in chemistry or other related science with sufficient chemistry courses is required; graduate degree is preferred. Valid driver's license and/or other means of reliable transportation required.

**Application Procedures:** Applicants must submit a state application (#10-012). Applications may be mailed to the Department of Criminal Justice Services, 805 East Broad Street, 10th Floor, Richmond, VA 23219, ATTN: Human Resource Office; emailed to: [gcolburn@dcjs.state.va.us](mailto:gcolburn@dcjs.state.va.us) or faxed to 804-786-6484. State application forms may be obtained by calling (804) 786-4246 or by downloading the form from the employment section of the DCJS web page at [www.dcjs.org](http://www.dcjs.org) For assistance, call Gene Colburn at (804) 786-6925. AN EQUAL OPPORTUNITY EMPLOYER

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### 3. DEA Special Testing and Research Laboratory

(First Posting)

**Position:** Mass Spectrometrists

**Location:** Dulles, VA

**Salary Range:** \$85,210 - \$110,775 [Note that this salary range will increase by approximately two percent if the pending (additional) Federal pay raise is enacted.]

**Application Deadline:** Open Until Filled

**Duties:** See: [jobsearch.usajobs.opm.gov](http://jobsearch.usajobs.opm.gov) (Vacancy #03-34-HPRF-01S)

**Qualifications:** Comprehensive knowledge, skills, and abilities in the theory and practice of high-res, tandem, LC/MS, and IRMS is required. Knowledge of organic synthesis and structural elucidation preferred. A Ph.D. in chemistry or related field is preferred. See the vacancy announcement for additional details.

**Application Procedures:** See the vacancy announcement and/or call 703/668-3300 if you have questions or need clarifications.

\* \* \* \* \*

## SCIENTIFIC MEETINGS

### 1. Title: MAAFS 2004 Annual Meeting

(First Posting)

**Sponsoring Organization:** Mid-Atlantic Association of Forensic Scientists

**Inclusive Dates:** April 20 - 24, 2004

**Location:** Wilmington, DE

**Contact Information:** Dan Katz, 302/577-3420 [Also see website]

**Website:** [www.maafs.org/annualmeeting.htm](http://www.maafs.org/annualmeeting.htm)

\* \* \* \* \*

### 2. Title: SWAFS Fall Conference

(First Bimonthly Posting)

**Sponsoring Organization:** Southwestern Association of Forensic Scientists

**Inclusive Dates:** October 11 - 15, 2004

**Location:** Oklahoma City, OK

**Contact Information:** Brandy Reese, 405/425-3857, [brandyr@osbi.state.ok.us](mailto:brandyr@osbi.state.ok.us)

**Website:** [www.swafs.us](http://www.swafs.us)

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### 3. Title: Joint Meeting of the Southern Association of Forensic Scientists, the Midwestern Association of Forensic Scientists, the Mid-Atlantic Association of Forensic Scientists, and the Canadian Society of Forensic Science

(First Bimonthly Posting)

**Sponsoring Organization:** Southern Association of Forensic Scientists

**Inclusive Dates:** September 19 - 24, 2004

**Location:** Lake Buena Vista, FL

**Contact Information:** David Baer, 407/650-5152, [davidb7818@aol.com](mailto:davidb7818@aol.com); Mike Healy 941/747-3011, Ext. 2280, [mike.healy@co.manatee.fl.us](mailto:mike.healy@co.manatee.fl.us)

**Website:** [www.southernforensic.org](http://www.southernforensic.org)

# Computer Corner

## Data Farms

# #180

by Michael J. Phelan  
DEA Digital Evidence  
Laboratory

The continuous evolution of digital technologies and their increasing acceptance by individuals and businesses places an enormous burden on law enforcement to maintain the capability to collect and analyze digital evidence. One major trend in particular that is pushing the current limits of law enforcement technology is the rapid growth of data farms (data warehouses). Data farms have arisen as a result of individuals and businesses needing or desiring to outsource their information storage needs to specialized companies.

### Individual Applications

Individuals can have data storage accounts either through their Internet service providers or through many major computer/software companies such as Apple Computer or Microsoft Corporation. A major advantage of storing data at data farms is that the information is retrievable at any time from any location in the world, so long the individual has Internet access.

### Business Applications

Data farms are similarly popular in the business world because they provide specialized Internet connectivity for e-commerce, and also provide very large on-line data storage and service. Data farms can contain multiple "front-end" servers that act as a portal to a company's web site

and serve as the first step in an e-commerce transaction. Front-end servers can support multiple Internet addresses. "Back-end" servers contain the e-commerce transactional databases and other critical information that need to be forwarded to other integral business entities such as the credit card companies that handle the financial transactions or the warehouses that actually ship the orders.

Data farms can be internal to a company, but as implied above they are more commonly provided by a disinterested provider for a fee. Commercial data farms can have hundreds or even thousands of customers, and a single account can easily store "terabytes" (1,000 billions or  $1 \times 10^{12}$  bytes) of information for a customer. Of concern to law enforcement, they are often located in a different state from the subject or business under investigation. Of even greater concern, many data farm companies are expected to move "off-shore" in the near future in an effort to reduce operating costs and provide greatly increased customer privacy and anonymity.

### Legal Jurisdiction

The challenges for law enforcement personnel involved in the investigation of an

individual or business that has information stored at a data farm are significant. First, the physical location of the data farm and the business must be determined, so that an appropriate search warrant can be issued within the proper judicial district. In the case of off-shore data farms, obtaining warrants will be problematic and in some cases impossible.

### Volume of Data

Second, the collection of the needed investigative data needs to be carefully delineated in order to avoid a massive data overload for both the forensic examiner(s) and the case agent. It is very helpful to know in advance what is required. For example, the scope of the investigation may require only e-mail, financial information, or e-commerce transactions. Such "targeted" searches reduce the data recovery problem to a reasonable volume.

Digital evidence laboratories must have standard operating procedures that can handle an on-site backup at a data farm. Such backups are nothing like the copying of a hard drive from a home computer. Complete sector-by-sector copies of hard drives are often highly desirable in small computer cases. However, collecting (for example) just the e-mail for a large multi-national organization

from a data farm (potentially a huge amount of information) requires a different approach.

### **Technology Considerations**

Third, the technologies used to collect on-site at a data farm require storage media with very large capacities, and also often require the examiner to use more sophisticated hardware and forensic collection procedures. For example, most data farm data collections involve interfacing with higher performance SCSI (Small Computer System Interface) hard drives. These SCSI drives can in turn be associated with highly sophisticated data redundancy storage protocols such as RAID (Redundant Array of Inexpensive Disks). RAID technology is a common multilevel hard drive redundant storage strategy that is found on many business network servers. Basic RAID technology can consist of hard drive mirroring. Other, even more advanced RAID concepts can consist of a technique called data striping, where information is spread over several hard drives; this makes recovery of any one failed hard drive a matter of evaluating the data on the other hard drives and determining if the missing data bit should be a one or a zero to satisfy a data check bit, commonly referred to as a parity bit.

Another redundancy technology utilized at some data farms is PERC (Power Edge RAID Controller). PERC utilizes unique chip sets installed on the motherboard or SCSI controllers of the computer/server. PERC chips or equivalent technologies

can complicate data export to non-PERC environments.

Obviously, an examiner who is trying to collect copies or “image files” on-site at a data farm needs to know what type data storage technologies are being used, in order to know how to acquire the evidence.

### **Investigative Understanding**

Fourth, computer forensic examiners must have a solid understanding of both networking and data warehousing technologies. Examiner personnel must also be able to determine the scope of the information network both forward in the information flow and retroactively. For example, DEA regularly encounters rogue Internet-based pharmacy operations. In many such cases, the data farm is located in a remote jurisdiction and is being operated by an unwitting data warehouse operator. The data farm may contain important e-commerce information and also log files of the communications with the actual (physical) pharmacy that fills and mails the prescription. Looking retroactively at the business, the data farm will have communication logs showing that a doctor with practically no patient interaction is approving customer requests. The doctor and the business can be located anywhere on the Internet, and can also be separate from each other. The web page design firm and the credit card/debit card billing can also be controlled from afar. Investigations of this type or of other types of Internet based fraud are some of the most complex encountered in digital

evidence forensics. Knowledge of what information is needed can assist the digital forensic collection team develop a proper scope of effort. This ensures that the investigation is not overwhelmed by voluminous data of marginal interest or value, that could easily take months to process.

### **New Sub-Specialization**

Digital evidence forensics is rapidly developing a series of sub-specializations as a result of the diversification of technology. Computer forensics, network forensics, volatile memory forensics, and data farm forensics are currently in high demand by law enforcement. However, these sub-disciplines require specialized knowledge, training, and equipment. The evolution of digital evidence forensics will span a new generation of technical training, improved hardware, and forensic software to address the unique data collection and data mining requirements associated with data farms. Similarly, a parallel evolution within the legal communities will need to occur, in order to standardize data recovery requests for law enforcement - which in turn will minimize disruption and cost for data farm businesses, and simplify the technical burden on digital evidence forensic data recovery specialists.

Questions or comments?  
E-mail: [mphelan@erols.com](mailto:mphelan@erols.com)



# Microgram

## *Bulletin*

**Published by:**

**The Drug Enforcement Administration  
Office of Forensic Sciences  
Washington, DC 20537**

The U.S. Attorney General has determined that the publication of this periodical is necessary in the transaction of the public business required by the Department of Justice. Information, instructions, and disclaimers are published in the January issues.

**VOL. XXXVII, NO. 4**

**APRIL 2004**

**- INTELLIGENCE ALERT -**

**STONERS AND BUDDAFINGAS CANDY BARS (CONTAINING THC)  
IN SAN FRANCISCO, CALIFORNIA**

The Division of Forensic Toxicology, Armed Forces Institute of Pathology (Rockville, Maryland), recently received two apparent candy bars labelled as Stoners and Buddafinga, that were visually similar to the commercial candy bars Snickers® and Butterfingers® (see Photo 1, right, and 2, next page). The bars, which weighed approximately 60 g each and were packaged in foil wrappers, were forwarded to the laboratory by the Coast Guard Marine Safety Office, San Francisco Bay, where they had been provided by a defense attorney for a merchant marine who tested positive for the tetrahydrocannabinol (THC) metabolite, THC-COOH, during a random urinalysis.



**Photo 1**

Following a multi-step liquid/solid extraction workup, analysis by GC-MS analysis confirmed THC at 360 micrograms/gram and 496 micrograms/gram for the Stoners and Buddafinga bars, respectively (equalling 21.6 and 29.8 milligrams of THC in the submitted bars). This was the first submission of these products to the laboratory.

[Editor's Notes: A similar exhibit of a "Stoners" candy bar was reported in the February 2004 issue of *Microgram Bulletin*. This is the first report of the "Buddafingas" candy bar. The "Buddafingas" wrapper lists the product as "TaiNTed / Buddafinga /

diggety, dankity, peanut-buttery!" and a consumer warning "For MEDICINAL Use Only". Both product wrappers also include marijuana leaf logos - it is therefore difficult to understand why anyone would attempt to present them as an explanation for "unknowingly" ingesting THC.



**Photo 2**

The source for these bars is currently unknown. An Internet search lists "Tainted Truffle" (a sub-title on the "Stoners" candy bar) as a supporting organization for a California based marijuana legalization lobbying group, with no further information. There is nothing on "Stoners" or "Buddafingas". A number of *Microgram* subscribers have requested information on the source of these products; therefore, if any subscriber is aware of that source, please forward that information to the Editor at: [microgram\\_editor@mailsnare.net](mailto:microgram_editor@mailsnare.net)

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### **- INTELLIGENCE ALERT -**

### **COUNTERFEIT METHYLPHENIDATE (RITALIN) TABLETS CONTAINING OXYCODONE IN SANTA ROSA, CALIFORNIA**

The California Bureau of Forensic Services Laboratory (Santa Rosa, California) recently received an apparently routine submission of four white tablets, diameter approximately 7 millimeters, with an "M" in a box on one side and scored with a "5" on the other, presumed methylphenidate (see Photos 3 and 4). The tablets were seized by the Santa Rosa Police Department pursuant to a routine traffic stop. The presumptive identification

was based on the Drug Identification Bible (2003 edition, pps. 162 and 266), indicating a Mallinckrodt Inc. product (Methylin®) containing 5 milligrams of methylphenidate. Analysis by GC/FID and GC/MS, however, indicated not methylphenidate but rather oxycodone with a trace of dihydrocodeinone (not quantitated). This was the first such submission to the laboratory.



**Photo 3**



**Photo 4**

**- INTELLIGENCE ALERT -**

**LOLLIPOPS CONTAINING THC IN OAKLAND, CALIFORNIA**

The Oakland Police Department Crime Laboratory (Oakland, California) recently received a case that included methamphetamine (0.41 grams), hashish (0.93 grams), MDMA (three clear, unmarked capsules containing white powder, weight not reported), and four green lollipops (total net mass 13.68 grams) suspected of containing THC (see Photo 5). The evidence was seized by the Oakland Police Department from a departing passenger at the Oakland International Airport who attempted to pass through a security checkpoint. The lollipops were 1.5 inches in diameter, were labelled “THCees Candies”, and had the California Health and Safety code for medicinal marijuana. The labels also indicated that the lollipops were flavored (see Photo 5; other flavors included grape and “Dr. Pepper”). Analysis of one of the lollipops by GC/MS confirmed THC (not quantitated). This is the first such submission to the laboratory.



**Photo 5**

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**- INTELLIGENCE ALERT -**

**UNUSUAL *l*-METHAMPHETAMINE CLANDESTINE LABORATORY  
IN LOS ANGELES, CALIFORNIA**

The DEA Southwest Laboratory (Vista, California) recently assisted agents from the Los Angeles Division in the seizure of an unusual clandestine methamphetamine laboratory in Los Angeles, California. The laboratory operators (all Asians) were manufacturing *l*-methamphetamine by hydrogenolysis of *d*-ephedrine or *l*-pseudoephedrine. In addition to producing the “wrong” isomer of methamphetamine, the reduction route was unusual. The ephedrine/pseudoephedrine was activated *in situ* with either nitric acid and/or sodium acetate, then directly reduced with hydrogen gas over a PdCl<sub>2</sub> / BaSO<sub>4</sub> catalyst in a large (30 L) hydrogenator (see Photo 6). Hydrogenolysis reductions are very common in the Far East; however, in the classical Asian methodology, the ephedrine/pseudoephedrine is first reacted with thionyl chloride to form the intermediate  $\alpha$ -chloro-methamphetamine, which is then reduced with hydrogen over a palladium based catalyst. The laboratory operators



**Photo 6**



also recrystallized the finished product from ethanol and water, to give *apparent* “Ice” methamphetamine HCl. Twenty eight kilograms of 99% *l*-methamphetamine HCl (packaged in Evian® water bottles) were recovered during the seizure (see Photos 7 and 8). Analysis was conducted with GC, IR, and CE. This is not the first ephedrine/pseudoephedrine hydrogenolysis laboratory seized with the assistance of the Southwest Laboratory; however, such laboratories are rarely encountered.



**Photo 7**



**Photo 8**

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### **- INTELLIGENCE ALERT -**

### **HARD-COVER BOOKS CONTAINING COCAINE IN NEW YORK, NEW YORK**

The DEA Northeast Laboratory (New York, New York) recently received six hard cover books with hidden (hollowed-out) compartments in each cover, all containing strip packages of white powder, suspected cocaine. The books (dimensions 9.5 x 11 or 12 inches, width not reported) were seized in New York City by agents from the New York Division (see Photo 9). The titles (all Spanish) included five books in the “History of Mankind” series, and also “Diana, Princess of Wales - A Life in Pictures”. The insides of each cover were sealed with paper to conceal the hollowed-out compartments. Analysis of the powder (total net mass 1.18 kilograms) by GC/FID, GC/MS, and FTIR confirmed 86 percent cocaine hydrochloride. The Northeast Laboratory routinely receives cocaine smuggled in different consumer and manufacturing items.



**Photo 9**

**- INTELLIGENCE ALERT -**

**WOODEN SHELVING BOXES CONTAINING COCAINE  
IN MIAMI, FLORIDA**

The DEA Southeast Laboratory (Miami, Florida) recently received three decorative wooden shelving units, each containing additional wooden figurines (e.g., see Photo 10). Concealed in the back of each box was a clear plastic package of white powder, dimensions 15 x 11.5 x 2 inches, suspected cocaine (see Photo 11). The units originated in Guatemala, and were seized by the Bureau of Immigration and Customs Enforcement at the International Mail Facility in Miami. There was nothing in any of the figurines. Analysis of the powder (total net mass 2,949 grams) by GC/MS and FTIR confirmed 88% cocaine hydrochloride. The laboratory routinely receives controlled substances smuggled within a wide variety of consumer items.



**Photo 10**



**Photo 11**

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**- INTELLIGENCE ALERT -**

**“CLEOPATRA’S MINI BATH TABLETS PASSION” CONTAINING DOVE  
LOGO MDMA TABLETS AND “CLEOPATRA’S EXOTIC BATH SALTS  
PASSION” CONTAINING “ICE” METHAMPHETAMINE FROM  
VANCOUVER, BRITISH COLOMBIA**

The DEA South Central Laboratory (Dallas, Texas) recently received ten cans of bath products, five labelled “Cleopatra’s Mini Bath Tablets Passion” and containing 4,889 tablets with “Dove” logos, suspected MDMA (see Photo 12, right, and 13, next page), and five labelled “Cleopatra’s Exotic Bath Salts Passion” and containing 985.2 grams of “shards” of slightly off-white crystalline material, suspected “Ice” methamphetamine (see Photo 14, next page). The exhibits originated in Vancouver, British Columbia, and were addressed to a location in Dallas,



**Photo 12**

Texas. The package was intercepted by the Canadian Customs Service and Royal Canadian Mounted Police (RCMP) and subsequently turned over to the DEA for a controlled delivery in Dallas. The tablets were white, round, biconvex, and averaged 280 milligrams; analysis by color tests, FTIR, GC/MS, GC/IRD, and HPLC, however, indicated not MDMA but rather 3,4-methylenedioxymphetamine (MDA) at 77 milligrams/tablet. Analysis of the crystalline shards by color tests, FTIR, GC/MS, GC/IRD, GC/FID, and HPLC confirmed 98% *d*-methamphetamine HCl. Although the laboratory has received similar exhibits, this is the first example of this type of packaging.



**Photo 13**



**Photo 14**

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### **- INTELLIGENCE BRIEF -**

### **COCAINE BRICKS IN PHILADELPHIA, PENNSYLVANIA**

The National Medical Services Laboratory (Willow Grove, Pennsylvania (north of Philadelphia)) recently received two "bricks" of suspected cocaine, one imprinted with an apparent Toyota car logo (see Photo 15), and the second imprinted with an unknown "3-Interlocking Rings" logo (see Photo 16). The bricks originated from a location in Texas (not



**Photo 15**



**Photo 16**



further specified), and were seized by the Montgomery County Narcotics Enforcement Team at the UPS Center in Philadelphia. The bricks both measured approximately 8 x 6 x 2 inches, and had a combined net mass of 1,993 grams. Each was wrapped in multiple layers of clear plastic cellophane, black rubber balloons, and brown and clear tape. Ground black pepper was interspersed between the layers of wrapping. Analysis by color tests and GC/MS confirmed cocaine (quantitation and determination of base versus HCl not performed). The laboratory has previously received similar bricks of cocaine, but this is the first submission that had logos.

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## **- INTELLIGENCE BRIEF -**

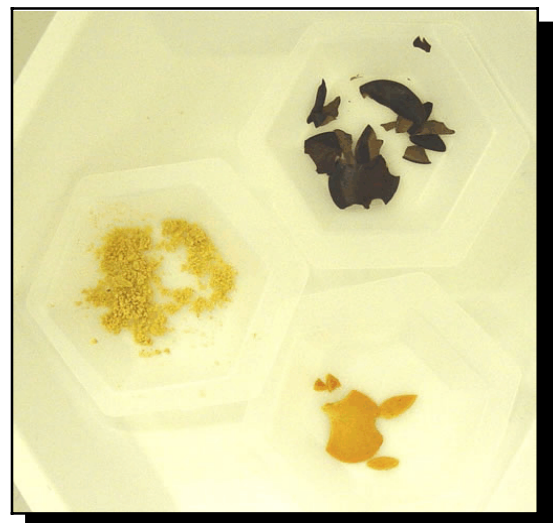
### **YOPO SEEDS IN CRETE TOWNSHIP, ILLINOIS**

The Illinois State Police, Joliet Forensic Science Laboratory (Joliet, Illinois) recently received a submission of semi-round to oval-shaped, brown, flat seeds, purported “yopo seeds” (see Photo 17). The exhibit was seized from a residence in Crete Township by the Will County Sheriff’s Department, pursuant to a domestic disturbance complaint (Will County is about 35 miles south of Chicago). Included with the seeds was an information sheet for “yopo seeds (*Anadenanthera peregrina*)”, which described its use by South American Indian tribes to induce trance states and visions, and to communicate with spirits. Instructions for usage called for dry-toasting the seeds until they popped like popcorn, and then grinding them into a powder which was to be snuffed.



**Photo 17**

The thin brown outer layer of the seeds was easy to remove, revealing a homogeneous yellow inner seed (see Photo 18). After grinding, a portion of the resulting powder was subjected to preliminary color testing: Ehrlich’s (purple), and Marquis (orange). A second portion was added to 1 N NaOH and extracted with chloroform. Analysis of the concentrated chloroform extract by GC/MS gave one peak with a fragmentation pattern consistent with psilocin or bufotenine. Analysis by GC versus laboratory standards confirmed bufotenine (not quantitated). The seeds were supposedly received by mail from the Netherlands. This was the first encounter with either yopo seeds or bufotenine at the laboratory.



**Photo 18**

**- INTELLIGENCE BRIEF -**

**PERUVIAN TORCH OR SAN PEDRO CACTI IN WISCONSIN**

Wisconsin State Crime Laboratory-Madison (Madison, Wisconsin) recently received two separate submissions of plant material having the physical appearance of sliced and dried cucumbers, suspected Peruvian Torch cacti (total net mass 1,030 grams) and psilocybe mushrooms (total net mass 18 grams), respectively (law enforcement organization, location, and circumstances of seizures not provided). The “mushrooms” were quickly recognized as actually being either Peruvian Torch or San Pedro cacti. These cacti are tubular-type plants from South America that contain mescaline. When harvested, spines are removed from the tubers, which are then sliced into disks and dried, giving them the appearance of dried cucumbers with green edges (see Photo 19). Following an acid-base extraction workup, analysis by GC/MS confirmed mescaline in both exhibits (quantitation not performed). These were the first known submissions of these type cacti to the laboratory.



**Photo 19**

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**- INTELLIGENCE BRIEF -**

**ANGEL TRUMPET IN MIAMI-DADE COUNTY, FLORIDA**

The Miami-Dade Police Department (Miami, Florida) recently received a submission of 21.7 grams of large, wilted, multicolored flowers, suspected Angel Trumpet, genus *Datura* or *Brugmansia* (see Photo 20). The flowers were seized by a Miami-Dade County Public Schools police officer from a middle school student. A literature search indicated that the alkaloidal compounds of interest in Angel Trumpet are scopolamine, atropine, and hyoscyamine. The flowers were chopped and refluxed with methanol, and the resulting solution was filtered and concentrated. Analysis of the extract by GC/MS confirmed scopolamine (quantitation



**Photo 20**

not performed). Atropine and hyoscyamine were not identified; however, these are more minor constituents and are not always encountered. No botanical examination was performed; therefore, the identification was presumptive. This is the laboratory's first encounter with Angel Trumpet.

[Editor's Note: Abuse of *Datura* species, including Angel Trumpet, has resulted in numerous deaths and injuries, including self-mutilations from extreme psychotic incidents. A overview of Angel Trumpet has been previously reported; see: Churchill KT. Angel Trumpet. *Microgram* 1995;28(8):250. Note that this issue of *Microgram* is law enforcement restricted.]

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#### **- INTELLIGENCE BRIEF -**

#### **BUFOTENINE IN MUNDELEIN, ILLINOIS**

The Northern Illinois Police Crime Laboratory (Highland Park, Illinois) recently received a submission of an unknown brown solid, total net mass 0.14 grams, in a metal mints container (photo not available). The exhibit was seized by the Mundelein Police Department from an individual involved in a traffic accident (Mundelein is about 20 miles north-northwest of Chicago). The substance superficially resembled "hash" or compressed plant material; however, microscopic and physical examination revealed that it was a hard crystalline solid. Analysis by color testing (cobalt thiocyanate (blue), Marquis (light orange), Mecke (brown), and Ehrlich's (purple)) and GC/MS indicated bufotenine (quantitation not performed). This was the first such submission ever received by the laboratory.

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#### **- INTELLIGENCE BRIEF -**

#### **METHAMPHETAMINE "SUPERLAB" SEIZED IN MODESTO, CALIFORNIA**

[From the NDIC *Narcotics Digest Weekly* 2004;3(9):2  
Unclassified, Reprinted with Permission.]

On February 7, 2004, agents from the Stanislaus Drug Enforcement Agency, California Multijurisdictional Methamphetamine Enforcement Team, and Central Valley High Intensity Drug Trafficking Area (HIDTA) arrested five Mexican nationals and seized an operational methamphetamine laboratory located in a residence in Modesto. Authorities had received information that several men who were staying at the residence had acquired large amounts of chemicals used to manufacture methamphetamine. Agents observed the residence for about a week and, after observing several men taking supplies commonly used to produce methamphetamine into the residence, obtained a search warrant. Shortly after the warrant was obtained, agents observed a suspect loading garbage bags into the back seat of his car before leaving the residence. The suspect was followed until he was away from the residence, when officers stopped his vehicle. A search of the vehicle revealed two garbage bags containing 80

pounds of ephedrine. The driver was arrested and charged with manufacturing methamphetamine and possession of a controlled substance for sale. After his arrest, agents prepared to serve the search warrant on the residence. Just prior to entering the residence, four suspects were observed fleeing. Three suspects were captured, arrested, and charged with manufacturing methamphetamine, criminal conspiracy, and resisting arrest. The fourth suspect was found in a trailer located on the property; he was arrested and charged with manufacturing methamphetamine, criminal conspiracy, battery on a police officer, and resisting arrest. Inside the residence agents found evidence of methamphetamine manufacture in every room. They seized over 300 gallons of alcohol, 96 pounds of red phosphorus, 80 pounds of ephedrine, and several weapons. This laboratory was the largest ever seized in Stanislaus County.

*NDIC Comment:* This laboratory was designated a super lab because officers concluded that it was capable of producing at least 10 pounds of methamphetamine per production cycle. Super labs located in California supply much of the domestically produced methamphetamine available throughout the country. According to the Drug Enforcement Administration (DEA) El Paso Intelligence Center (EPIC) National Clandestine Laboratory Seizure System (NCLSS), authorities reported that 788 methamphetamine laboratories were seized in California in 2003, of which 123 were super labs. Moreover, of the 55 reported methamphetamine laboratories seized in Stanislaus County in 2003, eight were super labs. Stanislaus County ranked fourth among California counties for the number of methamphetamine laboratories seized (55), after San Bernardino (152), Los Angeles (140), and Riverside (101) Counties.

\* \* \* \* \*

#### **- INTELLIGENCE BRIEF -**

#### **LSD LABORATORY SEIZED IN SEATTLE, WASHINGTON**

[From the NDIC *Narcotics Digest Weekly* 2004;3(9):2  
Unclassified, Reprinted with Permission.]

On February 5, 2004, agents from the DEA with assistance from the Seattle Police Department arrested an individual and seized chemicals and glassware necessary to manufacture LSD (lysergic acid diethylamide) from his residence. The suspect, a former computer executive who lived in a Seattle suburban estate valued at \$2.5 million, was arrested while away from his residence allegedly negotiating a purchase of ergotamine tartrate, an LSD precursor, via telephone from a source in Vietnam. After arresting the subject, DEA agents executed a federal search warrant at his residence resulting in the seizure of approximately 30 liters of chemicals including ether, chloroform, nitrogen, anhydrous ammonia, and bromide. Law enforcement officials also seized computers, glassware, a vacuum pump, a distillation unit, a manual explaining how to manufacture LSD, receipts for chemical and glassware purchases, and approximately 500 OxyContin tablets. According to DEA officials, the suspect had not produced any LSD. The suspect was charged with attempted manufacture of LSD and attempted possession of ergotamine tartrate. The King County Sheriff's Office, Seattle Fire Department, and Seattle Medic-1 Unit participated in this investigation.

(continued on page 73)

*NDIC Comment:* Seizures of LSD laboratories in the United States are rare. According to NCLSS seizure data, law enforcement officials seized one LSD laboratory in Kansas in 2000, one in Missouri in 2002, and one in California in 2003. Most LSD available in the United States is produced primarily in Northern California and the Pacific Northwest by a relatively small network of experienced chemists; however, independent dealers throughout the country produce the drug in limited quantities.

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**- INTELLIGENCE BRIEF -**

**“GRABA” (DRIED KHAT) SEIZED IN KANSAS CITY**

[From the *NDIC Narcotics Digest Weekly* 2004;3(13):3  
Unclassified, Reprinted with Permission.]

Missouri: On March 4, 2004, officers from the Kansas City Police Department seized three bundles of khat and three small plastic bags filled with a dried form of khat, known as graba, from a Kansas City apartment. Officers went to the apartment after receiving information that several Somali males at the apartment were in possession of khat. An officer knocked on the door of the apartment and, when one of the occupants opened the door, the officer observed several males holding a green leafy substance that he recognized as khat. When the individual who opened the door realized that police were present, he immediately tried to shut the door. However, three officers entered the apartment based on reasonable suspicion that a crime was occurring. Officers conducted a search of the apartment for additional individuals, during which time officers discovered a total of six men as well as three bundles of khat and two plastic bags filled with graba. Officers also requested and obtained consent to search one of the suspect's vehicles, where he located an additional plastic bag filled with graba. According to the Kansas City Police Department, the availability of khat leaves has declined in the Kansas City area. At the same time, the availability of graba has increased. This is at least the third time this year that Kansas City Police Department officers seized graba. On January 4, 2004, officers seized 13.2 pounds of graba from an Ethiopian national and on January 28, 2004, officers seized 38 grams of graba from a Somali national.

*NDIC Comment:* Graba, often similar in appearance to marijuana, usually is produced in Ethiopia and commonly is dried before it is transported to the United States. Graba, like fresh khat leaves, contains cathinone, a Schedule I drug under the Controlled Substances Act; however, according to DEA, cathinone in khat begins to degrade 48 hours after the plant has been cut. Conversely, the Kansas City Regional Crime Lab reports that dried graba leaves maintain their cathinone content for an extended period of time. Unlike fresh khat, graba does not need to be kept moist prior to consumption, making graba easier to transport and package.

[Editor's Notes: To clarify the apparent ambiguity between the DEA and Kansas City Regional Crime Lab statements, cathinone begins to degrade in fresh cut leaf within 48 hours, unless it is refrigerated or dried. Most of the khat seizures in this country are of fresh leaf, wrapped in a combination of moist paper and banana leaves or similar, and often shipped in coolers. The

appearance of “graba” in the U.S. may be in response to the loss of potency in the fresh leaf, resulting from degradation during extended shipping and/or Customs delays.]

\* \* \* \* \*

## **CORRECTIONS, CLARIFICATIONS, AND UPDATES**

### **Europol is Not Part of Interpol**

Sir: With regard to the March 2004 edition of *Microgram Bulletin*, and the item about 2C-I, your notes on page 48 referring to a related article in the May 2003 edition of the Europol *Drugs Intelligence Bulletin* are appreciated. However, please note that Europol is not “the drug arm of Interpol” as stated on page 49. In fact Europol is a totally separate entity - being the (single) law enforcement intelligence agency for the European Union. The Drugs Unit is a part of Europol which is mandated to deal with all areas of major organized crime. Europol co-operates with international organizations, including Interpol.

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### **Additional Information on N-Methylpyrrolidinone - I**

Sir: I have just received a copy of the March issue of *Microgram Bulletin* and read the Intelligence Alert regarding N-Methylpyrrolidinone (NMP). This compound was predicted to be a possible GHB analog in early 2001, and there is analytical information regarding it in the January 2001 issue of the CLIC Journal.

[Editor’s Notes: The referenced article is: Morris JA. Analogs of GHB. Part 2: Analytical Perspective. *Journal of the Clandestine Laboratory Investigating Chemists Association* 2001;11(1):16. Note that the *Journal of the Clandestine Laboratory Investigating Chemists Association* is a law enforcement restricted publication.]

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### **Additional Information on N-Methylpyrrolidinone - II**

Sir: Some paint strippers contain a mixture of GBL and NMP as solvents. It would not be inconceivable that some entrepreneur attempted to make GHB from such a solvent, not realizing (or caring) about the presence or adverse effects of NMP. The net result would be a combination of GHB and NMP, as mentioned in the March *Microgram Bulletin*.

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### **“Factory-Sealed” Cans May Not Be....**

Sir: The January 2004 issue of *Microgram Bulletin* contained an Intelligence Alert on Page 6 referring to the smuggling of marijuana in “factory-sealed” cans. Our laboratory had an



encounter with this technique many years ago (reported in *Microgram*\*), in an exhibit mailed from the Bahamas. The exhibit consisted of two apparently factory-sealed 5-lb cans of “processed cheddar cheese” which in fact contained compressed marijuana with lead weights incorporated to make the cans weigh a little over 5 pounds each. However, the cans only appeared to be factory-sealed. Removal of the labels revealed that the cans had been slit open along the circumference of the cans at the mid point of the sides, and the original contents removed and replaced; then the cut edges were filed smooth, carefully aligned back together again, and sealed with aluminum tape. With the labels then replaced, the cans appeared to be factory sealed with the tampering very effectively disguised – i.e., the cans exhibited a perfectly normal appearance. The latest report does not mention whether a similar technique was used, but it is important to note that exhibits of this type do not necessarily require commercial canning equipment to produce cans that appear to be “factory sealed.” As our experience demonstrated, the same appearance can be produced with relatively unsophisticated tools found in a home workshop. Investigators are therefore well advised to remove labels from suspicious containers to reveal what may be concealed underneath.

[\* The referenced Intelligence Brief citation is: *Microgram* 1987;20(4):48. Note that the *Microgram* was a law enforcement restricted publication in 1987, and remains under that restriction.]

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### **Unusual Solvent Mixture in Methamphetamine May Be NORPAR-15**

Sir: The January 2004 issue of *Microgram Bulletin* contained an Intelligence Brief on Page 9 referring to 7.5 kilograms of methamphetamine hydrochloride containing an unusual residual solvent mixture consisting of tridecane, tetradecane, pentadecane, and hexadecane (C-13 through C-16) in an approximate 1:20:4:2 ratio. An article about fire debris analysis published in the September 1995 issue of the *Southern Association of Forensic Sciences Newsletter* presented data for an Exxon product termed NORPAR-15, which contains a mixture of C-13 through C-17 hydrocarbons. The published chromatogram for NORPAR-15 appears to be remarkably similar to the chromatogram reported in the January 2004 *Microgram Bulletin* for the referenced residual solvent mixture, suggesting that it or a similar product was used during the illicit production of these methamphetamine hydrochloride exhibits.

\* \* \* \* \*

## Selected Intelligence Brief

### Piperazines

A number of piperazines have appeared on the illicit markets over the past few years, as MDMA mimics. These include the following compounds:

Piperazine	Most Commonly Used Acronym
1-Benzylpiperazine	BZP
1-(3-Chlorophenyl)piperazine	mCPP
1-(4-Methoxyphenyl)piperazine	MeOPP *
1-(3,4-Methylenedioxybenzyl)piperazine	MDBP
1-(3-Trifluoromethylphenyl)piperazine	TFMPP

\* The *meta*- (1-(3-methoxyphenyl)piperazine) and especially the *ortho*- (1-(2-methoxyphenyl)piperazine) isomers *may* also be circulating (to date, there has been no formal GC/MS study comparing the retention times and spectra of the three isomers). At present, all three isomers are abbreviated as MeOPP (the *ortho*- isomer has also been abbreviated as OMPP; however, this acronym is not commonly used at this time).

For a general overview on the piperazines (focusing on BZP and TFMPP), see: DEA Office of Domestic Intelligence, Domestic Strategic Intelligence Unit. BZP and TFMPP: Chemicals Used to Mimic MDMA's Effects. Microgram Bulletin 2002;35(5):123 (Note: Law Enforcement Restricted Issue).

Although there are extensive studies on the pharmacology and toxicology of the piperazines, there have been surprisingly few references providing analytical data for these compounds. Of note, BZP, mCPP, *ortho*-MeOPP, and TFMPP are all human metabolites of various prescription medications.

1. Aunan JE, Ely RA. Presented at the 9th Annual Clandestine Laboratory Investigating Chemists Association Technical Training Seminar, Toronto, Ontario, Canada, September 8 - 11, 1999. [Presents TLC, GC/MS, GC/IR, and FTIR for seven piperazines.]
2. de Boer D, Bosman IJ, Hidvegi E, Manzoni C, Benko AA, dos Reis LJAL, Maes RAA. Piperazine-like compounds: A new group of designer drugs-of-abuse on the European market. Forensic Science International 2001;121(1-2):47. [Presents mass spectral data for various piperazines.]
3. Kercheval JC. GC/MS analysis of BZP and TFMPP. Mid-Atlantic Association of Forensic Sciences Newsletter 2004, Issue 32-2 (no page numbers). [Presents the GC/MS analyses of BZP and TFMPP (includes mass spectra of both compounds)].

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## SELECTED REFERENCES

[Note: Selected references are a compilation of recent publications of presumed interest to forensic chemists. Unless otherwise stated, all listed citations are published in English. If available, the email address for the primary author is provided as the contact information. Listed mailing address information (which is sometimes cryptic or incomplete) exactly duplicates that provided by the abstracting services.]

1. Edwards HGM, de Oliveira LFC, Prendergast HDV. **Raman spectroscopic analysis of Dragon's Blood resins - Basis for distinguishing between Dracaena (Convallariaceae), Daemonorops (Palmae), and Croton (Euphorbiaceae).** *Analyst* 2004;129(2):134. [Editor's Notes: The title study is presented. Contact: Chemical and Forensic Sciences, School of Pharmacy, University of Bradford, Bradford BD7 1DP.]
2. Day JS, Edwards HGM, Dobrowski SA, Voice AM. **The detection of drugs of abuse in fingerprints using Raman spectroscopy I: Latent fingerprints.** *Spectrochimica Acta, Part A: Molecular and Biomolecular Spectroscopy* 2004;60(3):563. [Editor's Notes: Codeine phosphate, cocaine hydrochloride, amphetamine sulfate, barbitol, nitrazepam, caffeine, aspirin, paracetamol, starch, and talc were successfully identified in fingerprints using the title technique. Contact: Chemical and Forensic Sciences, University of Bradford, West Yorkshire, Bradford BD7 1DP.]
3. Kercheval JC. **GC/MS analysis of BZP and TFMPP.** *Mid-Atlantic Association of Forensic Sciences Newsletter* 2004, Issue 32-2 (no page numbers). [Editor's Notes: Presents the GC/MS analyses of 1-benzylpiperazine and 1-(3-trifluoromethylphenyl)piperazine. Contact: Western Maryland Regional Crime Laboratory, Hagerstown Police Dept. (no further addressing information was provided).]
4. Forgacs E, Cserhati T, Miksik I, Echardt A, Deyl Z. **Simultaneous effect of organic modifier and physicochemical parameters of barbiturates on their retention on a narrow-bore PGC column.** *Journal of Chromatography B - Analytical Technologies in the Biomedical and Life Sciences* 2004;800(1-2):259. [Editor's Notes: Presents the analysis of 22 barbiturates on a narrow-bore porous graphitized carbon column using water-dioxane mobile phases. Contact: E. Forgacs, Hungarian Acad Sci, Chem Res Ctr, Res Lab Mat & Environm Chem, POB 17, H-1525 Budapest, Hungary.]
5. Walker AJ, Bruce NC. **Combined biological and chemical catalysis in the preparation of oxycodone.** *Tetrahedron* 2004;60(3):561. [Editor's Notes: Presents the title synthesis using novel functionalized ionic liquids. Contact: NC Bruce, Univ Cambridge, Inst Biotechnol, Tennis Court Rd, Cambridge CB2 1QT, England.]

### Additional References of Possible Interest:

1. Garkani-Nejad Z, Karlovits M, Demuth W, Stimpfl T, Vycudilik W, Jalali-Heravi M, Varmuza K. **Prediction of gas chromatographic retention indices of a diverse set of toxicologically relevant compounds.** *Journal of Chromatography A* 2004;1028(2):287. [Editor's Notes: Kovats retention indices for 846 compounds are presented. Contact: Faculty of Science, Vali-e Asr University of Rafsanjan, Rafsanjan, Iran.]

2. Porrata T. **The Rave and Club Drug phenomenon: Dancing with darkness and danger.** Medical Legal Aspects of Drugs. Burns M, Ed. Lawyers and Judges Publishing Co.:2003, Chapter 10 (pps. 253-278). [Editor's Notes: Presents an overview of the title topic, and discusses its associated health and social problems. Contact: No contact information was provided.]
3. Miller S. **Separations in a monolith.** Analytical Chemistry 2004;76(5):99A. [Editor's Notes: Presents an overview of the use of monolithic columns for liquid chromatography. Contact: No contact information was provided.]
4. Zhang JY, Xie JP, Liu JQ, Tian JN, Chen XG, Hu ZD. **Microemulsion electrokinetic chromatography with laser-induced fluorescence detection for sensitive determination of ephedrine and pseudoephedrine.** Electrophoresis 2004;25(1):74. [Editor's Notes: The two substrates were derivatized with 4-chloro-7-nitrobenzo-2-oxa-1,3-diazol prior to analysis. The technique was applied to Chinese traditional herbal preparations. Contact: ZD Hu, Lanzhou Univ, Dept Chem, Lanzhou 730000, Peoples R China.]
5. Buryakov IA. **Express analysis of explosives, chemical warfare agents, and drugs with multicapillary column gas chromatography and ion mobility increment spectrometry.** Journal of Chromatography B - Analytical Technologies in the Biomedical and Life Sciences 2004;800(1-2):75. [Editor's Notes: The title technique was applied to analysis of heroin, cocaine hydrochloride, and cocaine base. Contact: Russian Acad Sci, Siberian Branch, DTIEGE, Pr Akad Koptiyuga 3, Block 6, Novosibirsk 630090, Russia.]

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## NEW EMAIL ADDRESSES NEEDED

The email addresses for the following organizations have returned rejection notices to the Microgram Editor for the past three issues of *Microgram Bulletin*, and will therefore be dropped from the subscription list unless a corrected email address is provided by the end of April 2004. Note that the errors include anti-spamming comments, mailbox full messages, and user not found or user unknown messages. The Editor requests your assistance in contacting these organizations, determining if they wish to remain on the *Microgram* subscription e-net, and if so asking them to provide a valid email address to the [microgram\\_editor@mailsnare.net](mailto:microgram_editor@mailsnare.net) address.

Bureau of Alcohol, Tobacco, and Firearms, National Laboratory Center, Rockville, Maryland

Lothian and Borders Police, Edinburgh, Scotland

Oklahoma State Bureau of Investigation, Tahlequah Laboratory

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**The following organizations (listed last month) were dropped on 3/31/04:**

Maine State Police Crime Laboratory - Augusta, Maine

Oakland County Sheriff's Department, Pontiac, Michigan

South Bank University London - United Kingdom

## THE JOURNAL/TEXTBOOK COLLECTION EXCHANGE

### *FREE TO ANY SUBSCRIBER*

Unless otherwise noted, requests for any of the following offerings should be emailed to the *Microgram* Editor at: [microgram\\_editor@mailsnare.net](mailto:microgram_editor@mailsnare.net) Requests should include complete mailing address information, **and should confirm that the provided destination is a “safe” (irradiation free) address.** Unless otherwise noted, in cases of competing requests, libraries have precedence. [Note: Postage for offerings from the DEA Office of Forensic Sciences will be covered by the Office.]

- 1) *Forensic Science International* 2002: 128(1-2); 128(3); 129(3); and 130 (2-3).

The next offering of journals and textbooks will be in the July 2004 issue of *Microgram Bulletin*.

**Subscribers are encouraged to donate surplus or unwanted items or collections; if interested, please consult the *Microgram* website for further instructions.**

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## THE DEA FY - 2004 STATE AND LOCAL FORENSIC CHEMISTS SEMINAR SCHEDULE

The remaining FY - 2004 schedule for the DEA's State and Local Forensic Chemists Seminar is as follows:

June 14 - 18, 2004

September 20 - 24, 2004

Note that the school is open only to forensic chemists working for law enforcement agencies, and is intended for chemists who have completed their agency's internal training program and have also been working on the bench for at least one year. There is no tuition charge for this course. The course is held at the AmeriSuites Hotel in Sterling, Virginia (near the Washington/Dulles International Airport). A copy of the application form is appended onto the October 2003 issue of *Microgram Bulletin*, and should be mailed to the Special Testing and Research Laboratory (Attention: Pam Smith or Jennifer Kerlavage) at: 22624 Dulles Summit Court, Dulles, VA 20166. For additional information, call 703 668-3337.

\* \* \* \* \*

## EMPLOYMENT OPPORTUNITIES

### 1. Broward County Sheriff's Office (BSO)

(Third and Final Posting)

**Position:** Crime Laboratory Manager

**Location:** Ft. Lauderdale, Florida

**Salary Range:** To Be Determined.

**Application Deadline:** Open Until Filled

**Duties:** This position directs, administers and manages all forensic services functions for the BSO (a 6,100 member department located in Ft. Lauderdale). Critical functions under charge include the Crime Laboratory, Automated Fingerprint Identification System (AFIS), and Latent Identification. Employees in this classification maintain responsibility for the direction, and management of personnel engaged in latent and ten-print identification, audio/video enhancements, quality control/quality assurance, DNA analysis, firearms and tool mark identification, forensic chemistry, questioned documents examination, and trace evidence analysis.

**Qualifications:** A Master's degree in chemistry, biology, or another physical science is required; a Ph.D. is preferred. The position also requires ten years experience that includes advanced forensic chemistry, biology or criminalistics preferably in a large national, state or regional laboratory. Thorough knowledge of DNA processing and American Society of Crime Laboratory Directors (ASCLD) certification required; certification by the American Board of Criminalistics (ABC) preferred. Experience in a managerial capacity with responsibility for administrative aspects of the work strongly desired.

**Application Procedures:** You may view a detailed job description, download an application or apply on-line at: [www.sheriff.org](http://www.sheriff.org). A completed application and accompanying resume will also be accepted by mail: Broward Sheriff's Office, Human Resources Bureau, 2601 W. Broward Blvd., Fort Lauderdale, FL 33312.

EOE M/F/D/V DFWP

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## **2. Virginia Department of Criminal Justice Services**

(Second Posting)

**Position:** Forensic Scientist II

**Location:** Roanoke, VA

**Salary Range:** \$39,901 - \$65,540

**Application Deadline:** Open Until Filled

**Duties:** Incumbent will: 1) Use current state-of-the-art methodologies and instrumentation to analyze controlled substances; 2) Prepare Certificates of Analyses on findings for use by the criminal justice system; and 3) Testify in court as a qualified expert for the Commonwealth at criminal proceedings as to the results of laboratory findings. Position requires occasional overnight travel. Employee will provide own transportation as required.

**Qualifications:** Knowledge, skills and abilities: Knowledge of basic theoretical principles and applications of the instrumentation and methodologies used to analyze controlled substances required. Knowledge of laboratory safety procedures; quality assurance/quality control and laboratory practices; instrumental analysis (GC, GC/MS, FTIR, UV) and experience in forensic drug analysis required. Successful completion of a documented training program and/or demonstration of competency is required. Experience presenting testimony in a court of law, as an expert witness is preferred. Must be able to analyze data, develop sound conclusions, maintain accurate records, and analyze, and solve technical problems. Ability to communicate effectively orally and in writing required. A baccalaureate degree in chemistry or other related science with sufficient chemistry courses is required; graduate degree is preferred. Valid driver's license and/or other means of reliable transportation required.

**Application Procedures:** Applicants must submit a state application (#10-012). Applications may be mailed to the Department of Criminal Justice Services, 805 East Broad Street, 10th Floor, Richmond, VA 23219, ATTN: Human Resource Office; emailed to: [gcolburn@dcjs.state.va.us](mailto:gcolburn@dcjs.state.va.us) or faxed to 804-786-6484. State application forms may be obtained by calling (804) 786-4246 or by downloading the form from the employment section of the DCJS web page at [www.dcjs.org](http://www.dcjs.org) For assistance, call Gene Colburn at (804) 786-6925.

AN EQUAL OPPORTUNITY EMPLOYER

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## **3. DEA Special Testing and Research Laboratory**

(Second and Final Posting)

**Position:** Mass Spectrometrists

**Location:** Dulles, VA

**Salary Range:** \$85,210 - \$110,775 [Note that this salary range will increase by approximately two percent if the pending (additional) Federal pay raise is enacted.]

**Application Deadline:** Open Until Filled

**Duties:** See: [jobsearch.usajobs.opm.gov](http://jobsearch.usajobs.opm.gov) (Vacancy #03-34-HPRF-01S)

**Qualifications:** Comprehensive knowledge, skills, and abilities in the theory and practice of high-res, tandem, LC/MS, and IRMS is required. Knowledge of organic synthesis and structural elucidation preferred. A Ph.D. in chemistry or related field is preferred. See the vacancy announcement for additional details.

**Application Procedures:** See the vacancy announcement and/or call 703/668-3300 if you have questions or need clarifications.

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## SCIENTIFIC MEETINGS

### 1. Title: NEAFS 30th Annual Meeting

(First Bimonthly Posting)

**Sponsoring Organization:** Northeastern Association of Forensic Scientists

**Inclusive Dates:** September 29 - October 2, 2004

**Location:** Mystic, CT

**Contact Information:** Tammi Jacobs Shulman, 914/231-1630; [tjl1@westchstergov.com](mailto:tjl1@westchstergov.com)

**Website:** [None Listed]

\* \* \* \* \*

# Computer Corner

## The March of Time

# #181

by Michael J. Phelan  
DEA Digital Evidence  
Laboratory

Last month's 180th Edition of Computer Corner marked the 15th year that this column has been continuously published in *Microgram* or *Microgram Bulletin*.

### The Past

The first ten years of Computer Corner (Editions 1 through 120) were nearly all authored by Senior Forensic Chemist Charles W. Harper of DEA's Special Testing and Research Laboratory, then located in McLean, Virginia. The focus of those columns was the emerging use of PC technology within a forensic drug laboratory. Although it is hard to recall in today's computer-intensive environments, the use of computers in forensic drug laboratories was still rather unusual 15 years ago, when the column started. Issues such as computer and laboratory instrument interfaces, data storage, compatibility issues, and a wide variety of PC hardware, software, and operating system considerations were presented

and discussed. Of course, many of the specific recommendations made 10 to 15 years ago have since been eclipsed by advances in technology, but the fundamental issues and concerns regarding computers in a laboratory environment still remain a pertinent topic for laboratory managers. In addition, the retrospective review of the history of computer use in forensic drug laboratories provided by the first ten years of Computer Corner place today's issues in better context.

Editions 121 through 180 were written by myself, and focus exclusively on computer forensics. This column represents the longest (and possibly the only) continuous chronology of and commentary on the rapidly evolving forensic discipline of digital evidence. A content analysis of the articles published over the last five years clearly shows the evolution of the discipline. Technologically, the era of DOS-based forensic

examination techniques has evolved into Windows-based solutions. Similarly, concerns over software tool capabilities have migrated to broader areas of concern, including (but not limited to) best practices, laboratory accreditation, network data acquisition, volatile memory forensics, and most recently data farm evidence collection.

### Archive Now Available

In recognition of the 15 Year Anniversary, and mindful of the value of the historical record for organizations now involved in digital evidence, the DEA Office of Forensic Sciences is making available to law enforcement organizations (only) the complete set of the published Computer Corner articles. This collection, Editions 1 through 180, will be provided in .pdf format on a CD, and will be provided free of charge. Requests for a copy should be written on letterhead stationery and directed to:

Mr. Thomas J. Janovsky  
Deputy Assistant Administrator  
Office of Forensic Sciences  
2401 Jefferson Davis Highway  
Alexandria, VA 22301 USA

### **The Future**

Expect an even wider discussion  
of digital evidence forensic  
topics to be included in the

Computer Corner columns over  
the next five years. The  
convergence of hand held  
consumer electronics, wireless  
technology, encryption, and  
incredibly large storage  
capacities will force significant  
changes in both digital evidence  
collection and examination  
strategies.

A list of the Computer Corner  
Editions (by number and title) is  
included below.

Questions or comments?

E-mail: [mphelan@erols.com](mailto:mphelan@erols.com)

### **Computer Corner No.**

- 1 Glossary
- 2 Hardware - Software
- 3 Purchasing Computer Systems
- 4 Setting Up a System
- 5 Data Storage Devices
- 6 Barcoding
- 7 Hard Disks - A Primer
- 8 MS-DOSTM - File Allocation Tables
- 9 LIMS Systems
- 10 LIMS Systems - Operational
- 11 MS-DOSTM - Directory Structure
- 12 MS-DOSTM - Directory Structure
- 13 MS-DOSTM - Directory Structure
- 14 MS-DOSTM - Directory Structure
- 15 Storage Devices - Tape Data
- 16 Trouble Shooting
- 17 Communications - Lab Data
- 18 Communications - Serial (RS-232)
- 19 Communications - Parallel (HPIB)
- 20 Operating Systems
- 21 RAM Memory
- 22 Upgrading
- 23 Ports
- 24 Optical Drives (WORM)
- 25 Optical Drives (WORM)
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- 36 MS-DOSTM - File Attributes
- 37 Printers - Lasers

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- 75 Internet - Part 3 - Netiquette & the End of an Era
- 76 Internet - Part 4 - Hardware & Software
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- 83 Application Software Usability - Part II
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- 86 Cooling Systems
- 87 Upgrade or Replace: Considerations Part 1 of 3
- 88 Upgrade or Replace: Upgrade Recommendations Part 2 of 3

89 Upgrade or Replace: Replacement Recommendations Part 3 of 3  
90 Training  
91 Software Can Kill  
92 Online Blues  
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94 A "Cookie" in Your Computer?  
95 Backups How Many Are Enough?  
96 Chuck Installs Windows 95  
97 Installing a Modem  
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99 Networking, II - Physical Components  
100 Networking, III - Logical Construction  
101 Your Computer and the Year 2000  
102 Productivity and Computers  
103 Productivity and Computers, Part 2  
104 Hardware Costs; Ever Downward!  
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106 Pointing Devices  
107 Year 2000 - The Saga Continues  
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#122 The Electronic Crime Scene  
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# Microgram

## *Bulletin*

**Published by:**

**The Drug Enforcement Administration  
Office of Forensic Sciences  
Washington, DC 20537**

**The U.S. Attorney General has determined that the publication of this periodical is necessary in the transaction of the public business required by the Department of Justice. Information, instructions, and disclaimers are published in the January issues.**

**VOL. XXXVII, NO. 5**

**MAY 2004**

**- INTELLIGENCE ALERT -**

**“SPLIF” PEANUT BUTTER (CONTAINING TETRAHYDROCANNABINOL)  
NEAR LAREDO, TEXAS**

The DEA South Central Laboratory (Dallas, Texas) recently received a jar of apparent peanut butter, suspected to contain  $\Delta^9$ -tetrahydrocannabinol (THC), with a label that is visually similar to the commercial peanut butter product Jif® (see Photo 1). The exhibit was seized from an individual at a U.S. Border Patrol checkpoint on IH-35, 16 miles north of Laredo, Texas. The labelling on the jar includes “Splif Peanut Butter”, “Choosy Patients Choose Splif”, a marijuana leaf logo with the word “Tainted”, and user instructions (see Photos 2 and 3, next page). The exhibit (total net mass not measured) had a strong odor both of peanut butter and marijuana. Analysis by color testing and GC/MS confirmed THC (not quantitated). This is believed to be the first such exhibit received by the laboratory.



**Photo 1**





Photo 2

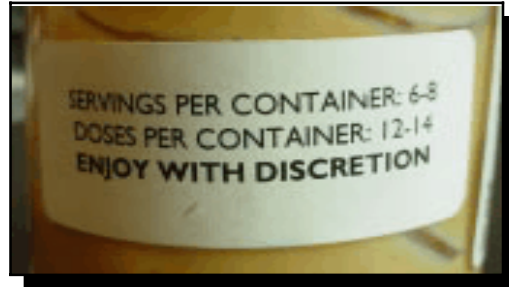


Photo 3

\* \* \* \* \*

**- INTELLIGENCE ALERT -**

**“SWEETART” CANDIES ADULTERATED WITH  
5-METHOXY-*ALPHA*-METHYLTRYPTAMINE IN LINCOLN, NEBRASKA**

The DEA North Central Laboratory (Chicago, Illinois) recently received 18 stained "Sweetart"® candies, suspected to contain lysergic acid diethylamide (LSD) (see Photo 4). The exhibits were seized pursuant to a traffic stop in Lincoln, Nebraska by the Nebraska State Patrol (18 of 36 candies submitted for analysis). Each candy was visibly stained on both the top and bottom surfaces. A cross section one of the candies demonstrated staining though the middle of the tablet, however, it was not possible to determine if the applied solution had soaked through the candy, or if the solution had been applied to both faces. The stained areas were more easily viewed with an ultraviolet light source (e.g., see Photo 5). Some of the candies fluoresced more intensely than others, suggesting that the drug strength varied significantly from tablet to tablet (ultraviolet light at 495 nanometers and an orange #56 filter exhibited the most contrast for photography). Analysis of the tablets (total net mass of 18 candies 30.3 grams) by GC/MS and UV/Vis identified not LSD but rather 5-methoxy-*alpha*-methyltryptamine (5-MeO-AMT) (not quantitated). This was the first seizure of this type submitted to the laboratory.



Photo 4

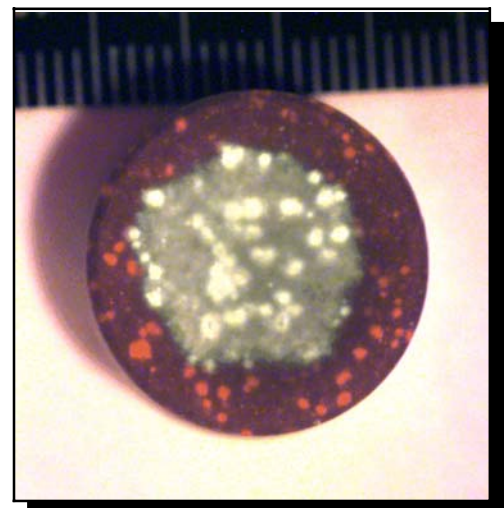


Photo 5

**- INTELLIGENCE ALERT -**

**“BLACK CRACK” IN ROANOKE, VIRGINIA**

The DEA Mid-Atlantic Laboratory (Largo, Maryland) recently received a submission of a brown/black rock-like material with a faint tar-like odor, suspected “crack” cocaine. The outer surface was speckled brown in color, while the inner portion of the material was black in color (see Photo 6). The exhibit was seized pursuant to a vehicle search in Roanoke, Virginia by the Roanoke City Police. Analysis of the exhibit (total net mass 0.32 grams) by GC/FID, GC/MS, and FT-IR confirmed 86 percent cocaine base. No adulterants or diluents were detected, and the coloring agent was not identified. This was the first submission of “Black Crack” received by the laboratory.



**Photo 6**

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**- INTELLIGENCE ALERT -**

**TRANSMISSION GEAR CONTAINING HEROIN FROM ECUADOR**

**UNKNOWN MACHINERY PART CONTAINING HEROIN FROM MEXICO**

The DEA Northeast Laboratory (New York, New York) recently received a sealed "transmission gear" (see Photo 7) containing a whitish powder. The exhibit (gross weight 17.7 kilograms, size 16 x 6 inches) originated from Ecuador and was seized by Customs inspectors at the Miami, Florida Express Mail Facility. Preliminary X-ray inspection (by the inspectors) indicated a dense area inside the gear. A drilled hole revealed a powder that field-tested positive for heroin. Analysis of the powder (total net mass 1.05 kilograms) by GC/FID, GC/MS and FTIR confirmed 93 percent heroin hydrochloride.



**Photo 7**

- - - - -

The Laboratory also received a second exhibit from the Miami, Florida Express Mail Facility that consisted of a sealed metal cylinder (see Photo 8, next page) containing a powder. Despite

the presence of a detailed identification plate (see photo), the identity and function of the item could not be determined. An extensive examination by Customs inspectors resulted in recovery of a small amount of powder that field-tested positive for heroin. At the laboratory, metal cutting tools were required to access the interior. Analysis of the recovered powder (total net mass 1.05 kilograms) by GC/FID, GC/MS and FTIR confirmed 72 percent heroin hydrochloride.

The DEA Northeast Laboratory routinely receives heroin smuggled from throughout Central and South America in various types of containers (for another example of a large metal “gear”, see the December 2003 issue of *Microgram Bulletin*); however, these types of submissions are occurring with increased frequency.



**Photo 8**

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### **- INTELLIGENCE ALERT -**

#### **ACRYLIC KEY CHAIN FOB CONTAINING APPARENT COCAINE AND AN APPARENT COCA LEAF IN COLLIER COUNTY, FLORIDA**

The Florida Department of Law Enforcement, Fort Myers Regional Laboratory (Fort Myers, Florida), recently received an acrylic key chain fob which included a leaf and a capsule of off-white powder, suspected to be a coca leaf and cocaine (see Photo 9). The item was seized by the Collier County Sheriff's Office pursuant to a domestic disturbance (Collier County is south of Fort Myers, and includes the city of Naples). The fob measured 35 x 35 millimeters, weighed 20.2 grams, and had a thick, clear acrylic layer sealed onto a white acrylic base; it was marked “COCA” and “NO CONSUMA DROGA” (roughly: “Don't Take Drugs”). Access to the powder was gained by drilling a hole above the capsule. Analysis of the powder (about ½ gram recovered) by color testing, GC, and GC/MS, however, indicated no controlled substances. The leaf (which appeared to be a genuine coca leaf) was not analyzed. This was the first such exhibit received by the laboratory.



**Photo 9**

**- INTELLIGENCE ALERT -**

**DOMINICAN TRAFFICKERS HIDING DRUGS IN REMOTE WOODED  
AREAS IN NORTH-CENTRAL MASSACHUSETTS**

[From the NDIC *Narcotics Digest Weekly* 2004;3(16):1  
Unclassified, Reprinted with Permission.]

On April 5, 2004, investigators with the North Worcester County Drug Task Force reported that Dominican criminal groups in north central Massachusetts increasingly are burying heroin and cocaine or concealing the drugs in false rocks in remote wooded areas for the purpose of short-term storage. The drugs usually are packaged in glassine bags and wrapped in plastic before being buried or hidden in false rocks. Investigators report that Dominican retail-level heroin and cocaine distributors - typically from Fitchburg, Gardner, and Leominster - often receive purchase requests via cellular phones and then drive to the wooded area to retrieve enough heroin or cocaine to complete the sale. The distributors then travel to a prearranged location, such as a public parking lot, to meet the buyer. The distributors typically retrieve between a half-bundle (5 glassine bags each containing approximately 50 to 100 milligrams of powder) to 1 bundle (10 glassine bags) of heroin or gram quantities of cocaine.

*NDIC Comment:* This concealment technique (first reported in 2002) has become common in north central Massachusetts. Previously, Dominican heroin and cocaine distributors in the area concealed stashes of heroin and cocaine inside residences. Investigators discovered this concealment method after noticing a decrease in the amount of drugs that distributors were storing at their residences.

\* \* \* \* \*

**- INTELLIGENCE BRIEF -**

**MDMA TABLETS WITH “BART SIMPSON” LOGOS  
IN OAKLAND, CALIFORNIA**

Over a recent three month time frame, the Oakland Police Department Criminalistics Laboratory (Oakland, California) received a variety of tablets bearing the Bart Simpson logo, all suspected Ecstasy. The tablets were all seized in Oakland, California, pursuant to four different enforcement actions by the Oakland Police Department. Two light-red colored tablets (net mass of one tablet 0.16 grams, diameter not measured) were part of a polydrug seizure pursuant to a traffic violation (photo not provided). A pink-salmon colored tablet (net mass 0.17 grams, diameter approximately 0.2 inches) was seized pursuant to a prostitution sting (see Photo 10). Three green tablets (net mass of one tablet 0.20 grams, diameter approximately 0.2 inches) were part of a polydrug seizure pursuant to a traffic



**Photo 10**





**Photo 11**



**Photo 12**

violation (see Photo 11). Finally, 10 speckled green tablets (net mass of one tablet 0.19 grams, diameter approximately 0.2 inches) were part of a polydrug seizure pursuant to the arrest of a street level dealer (see Photo 12). Analysis of the various seizures by three color/spot tests (not specified) and two microcrystalline tests (not specified) confirmed MDMA (not quantitated). These were the first submissions of “Bart Simpson” logo Ecstasy tablets to the laboratory.

\* \* \* \* \*

#### **- INTELLIGENCE BRIEF -**

#### **5-METHOXY-N,N-DIMETHYLTRYPTAMINE NEAR BROOKSVILLE, FLORIDA**

The Florida Department of Law Enforcement, Tampa Crime Laboratory (Tampa, Florida) recently received a small amount (less than 0.01 gram) of a white powder from the Hernando County Sheriff’s Department. The powder was seized by the Hernando County Sheriff’s Department pursuant to the investigation of a physical confrontation in Brooksville (approximately 60 miles north of Tampa), and field-tested negative for cocaine and methamphetamine. Analysis by GC and GC/MS indicated 5-methoxy-N,N-dimethyltryptamine (5MeO-DMT) (not quantitated). The suspect claimed to have synthesized the material himself; however, no clandestine laboratory was discovered as a result of the investigation. This is the first time the laboratory has encountered 5-MeO-DMT.

\* \* \* \* \*

#### **- INTELLIGENCE BRIEF -**

#### **POLYDRUG SEIZURE INCLUDING A LARGE QUANTITY OF GHB/GBL IN CANADIAN COUNTY, OKLAHOMA**

The Oklahoma State Bureau of Investigation’s Central Drug Lab (Oklahoma City, Oklahoma) recently received a polydrug seizure including four vials (one unlabelled, containing a white powder (suspected ketamine), two labelled nandrolone decanoate (1 milliliter each), and one labelled testosterone cypionate (10 milliliters)), six plastic one gallon jugs containing liquids (suspected GBL), a plastic bag of tan powder (suspected methamphetamine), and twenty-six bags of white, crystalline powder (suspected “Ice” methamphetamine) (see Photo 13, next page).



**Photo 13**

The exhibits were seized pursuant to a traffic stop by the Oklahoma Highway Patrol in Canadian County (approximately 30 miles west of Oklahoma City). The suspect claimed to be travelling from California to New York and Washington, DC. Analysis of the contents of labelled vials by GC and GC/MS confirmed nandrolone decanoate and testosterone cypionate. Analysis of the powder in the fourth vial (total net mass 0.3 grams) by GC and GC/MS confirmed ketamine. Analysis of the liquid contents of the jugs (total gross weight 56.5 pounds) by GC and GC/MS indicated a mixture of GHB and GBL (not quantitated). Analysis of the tan powder in the plastic bag (total net mass 89.7 grams) by GC, GC/MS, and HPLC confirmed 72.5 percent methamphetamine hydrochloride. Analysis of the white powders in the plastic bags (total net mass 1301 grams) by GC, GC/MS, and HPLC confirmed methamphetamine hydrochloride; however, the purities ranged from 58.3 to 73.4 percent, with an average of 65.2 percent (isomer not determined). Therefore, the exhibits were not “Ice”. The quantities of GHB/GBL and methamphetamine were unusually large submissions for the laboratory.

\* \* \* \* \*

### **- INTELLIGENCE BRIEF -**

#### **MIS-LABELLED STEROID AMPULE IN LEWISVILLE, TEXAS**

The DEA South Central Laboratory (Dallas, Texas) recently received a submission of 281 ampules labelled as nandrolone decanoate (see Photo 14 and labelling information, next page). The exhibit was seized pursuant to a residential search by Customs agents in Lewisville, Texas (just north of Dallas/Fort Worth). Analysis by GC/MS, FTIR, and HPLC, however, indicated not nandrolone decanoate but rather testosterone enanthate 200 milligrams/milliliter in injectable oil (oil not identified). Because the amount (1 milliliter per ampule) and concentration matched



the labelling, it is suspected that this exhibit represented a licit product that was mislabelled. The laboratory has previously received exhibits of both nandrolone decanoate and testosterone enanthate, and has also previously received mislabelled steroids, both licit and counterfeit products.

Labelling Information

1mL  
Deca Durabolin  
200 mg/mL  
Nandroloni decanoas  
I.M. inject/inject. I.M.  
I.M. injekt.  
1 mL: 200 mg  
Nandrolon. Decanoat.  
Organon Europe  
Exp 09/2007  
Lot 00K25



**Photo 14**

\* \* \* \* \*

**- INTELLIGENCE BRIEF -**

**MDMA MIMIC TABLETS WITH CROSS LOGOS CONTAINING  
PHENCYCLIDINE (PCP) AT A CLANDESTINE METHAMPHETAMINE  
LABORATORY IN WALDORF, MARYLAND**

The DEA Mid-Atlantic Laboratory (Largo, Maryland) recently received 198 blue tablets with a cross logo on one side and a single score mark on the other, suspected Ecstasy (see Photo 15). The tablets were recovered at an iodine - red phosphorous methamphetamine clandestine laboratory in Waldorf by chemists from the Mid-Atlantic Laboratory and agents from the Washington, DC HIDTA Group (Waldorf is about 20 miles south-southwest of Washington, DC). The tablets were round, biconvex, approximately 10 millimeters in diameter, and weighed 256 milligrams each. Analysis by color testing, GC, FTIR, and GC/MS, however, indicated not MDMA but rather phencyclidine (PCP) (0.38 milligrams/tablet). This was the first submission to the laboratory of suspected Ecstasy tablets containing only PCP. There was no indication that PCP was being produced at the clandestine laboratory.



**Photo 15**

## CORRECTIONS, CLARIFICATIONS, AND UPDATES

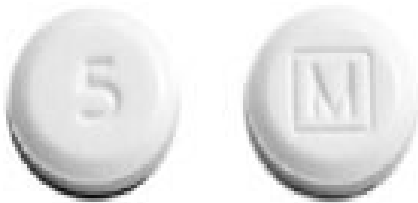
### “COUNTERFEIT” METHYLPHENIDATE TABLETS CONTAINING OXYCODONE ARE A GENUINE OXYCODONE PREPARATION

[Editor's Preface: The April 2004 issue of *Microgram Bulletin* included an Intelligence Alert that reported an apparent methylphenidate tablet that actually contained oxycodone. In fact the tablet was almost certainly a genuine oxycodone preparation. The misidentification resulted from an error in the 2003 *Drug Identification Bible* - that in turn was likely caused because the manufacturer's (Mallinckrodt) five milligram methylphenidate tablet is highly similar in appearance to their five milligram oxycodone tablet (see Photos 16 and 17). Over 20 laboratories pointed out this error since the publication of the April 2004 issue. The following letter is representative of all the submissions concerning this issue. Thanks to everyone who submitted a correction.]

Sir: With regard to the April 2004 edition of *Microgram Bulletin*, and the Intelligence Alert on counterfeit methylphenidate tablets containing oxycodone, the Florida Department of Law Enforcement (Tampa Laboratory) has had several encounters with these tablets. The presence or absence of "scoring" is critical in the presumptive identification of these tablets. Unscored, "M5" tablets contain methylphenidate HCl 5 mg (NDC#00406-1121-01). Scored, "M5" tablets contain oxycodone HCl 5 mg (NDC# 00406-0552-01). The "5" is above the score. In each case the tablets are white, the "M" is inside a square and the "5" is on the opposite side. Both pharmaceuticals are manufactured by Mallinckrodt. Per a conversation with a Mallinckrodt pharmacist on 5/12/04, Mallinckrodt will be making changes to further distinguish these preparations. They can be viewed on the Mallinckrodt web page at: [www.mallinckrodt.com](http://www.mallinckrodt.com)

Anne J. Person

Florida Department of Law Enforcement, Tampa Crime Laboratory



**Photo 16 - Methylphenidate**

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**Photo 17 - Oxycodone**

## SELECTED REFERENCES

[Notes: Selected references are a compilation of recent publications of presumed interest to forensic chemists. Unless otherwise stated, all listed citations are published in English. If available, the email address for the primary author is provided as the contact information. Listed mailing address information (which is sometimes cryptic or incomplete) exactly duplicates that provided by the abstracting services. In addition, in order to prevent automated theft of email addresses off the Internet postings of *Microgram Bulletin*, unless otherwise requested by the corresponding author, all email addresses reported in the *Bulletin* have had the “@” character replaced by “-at-”; this will need to be converted back (by hand) before the address can be used.]

1. Rendle DF. **Use of X-rays in the United Kingdom Forensic Science Service.** *Advances in X-ray Analysis* 2003;46:17. [Editor's Notes: Presents four case studies, including the use of XRD in the analysis of “street drug seizures” (not specified in the abstract). Contact: Forensic Science Service, London Laboratory, London SE1 7LP, UK.]
2. Dongre VG, Kamble VW. **HPTLC detection and identification of heroin (diacetylmorphine) in forensic samples. Part III.** *Journal of Planar Chromatography - Modern TLC* 2003;16(6):458. [Editor's Notes: Presents a new spray reagent for detection of heroin and similar opium alkaloids after TLC elution. Contact: Department of Chemistry, Dr Babasaheb Ambedkar Marathwada University, Aurangabad 431 004, India.]
3. Hosokawa K, Shibata T, Nakamura I, Hishida A. **Discrimination among species of Papaver based on the plastid rp116 gene and the rp116-rp114 spacer sequence.** *Forensic Science International* 2004;139(2-3):195. [Editor's Notes: Five of six species of papaver were distinguishable using the title technique. Contact: Faculty of Health Sciences, Department of Nutritional Management, Hyogo University, 2301 Shinzaike, Hiraoka-cho, Kakogawa City, Hyogo 675-0101, Japan.]
4. Dal Cason TA, Franzosa ES. **Occurrences and forms of the hallucinogens.** *Hallucinogens* 2003;37. [Editor's Notes: A review, including LSD and its analogs, indoalkylamines, hallucinogenic phenethylamines, PCP and its analogs, ketamine, and *beta*-carboline. Contact: The DEA North Central Laboratory, 536 S. Clark St., Room 800, Chicago, IL 60605. Note - No reprints available.]
5. Nugent KG, Saville BJ. **Forensic analysis of hallucinogenic fungi: A DNA-based approach.** *Forensic Science International* 2004;140(2-3):147. [Editor's Notes: Presents the title study. Contact: Department of Botany, University of Toronto at Mississauga, Mississauga Road North, Ont., Mississauga 3349, Can.]
6. Waddell RJH, NicDaeid N, Littlejohn D. **Classification of ecstasy tablets using trace metal analysis with the application of chemometric procedures and artificial neural network algorithms.** *Analyst* 2004;129(3):235. [Editor's Notes: Presents a study of the practicality of ICP-MS for sample-sample comparisons. Several statistical analyses are evaluated. Contact: Forensic Science Unit, Department of Pure and Applied Chemistry, University of Strathclyde, 204 George Street, Glasgow G1 1XW.]
7. Buryakov IA, Kolomiets YN. **Rapid determination of explosives and narcotics using a multicapillary-column gas chromatograph and an ion-mobility spectrometer.** *Journal of*

- Analytical Chemistry - Russia (translation of *Zhurnal Analiticheskoi Khimii*) 2003;58(10):944. [Editor's Notes: The title technique was applied to detection of heroin, cocaine HCl and cocaine base (crack). This article appears to be very similar or identical to that published by the primary author in the *Journal of Chromatography B - Analytical Technologies in the Biomedical and Life Sciences* 2004;800(1-2):75. Contact: Siberian Division, Design and Technological Institute of Instrument Making for Geophysics and Ecology, Russian Academy of Sciences, Novosibirsk, Russia 630090.]
8. EHefnawey GB, ElHallag IS, Ghoneim EM, Ghoneim MM. **Voltammetric behavior and quantification of the sedative-hypnotic drug chlordiazepoxide in bulk form, pharmaceutical formulation, and human serum at a mercury electrode.** *Journal of Pharmaceutical and Biomedical Analysis* 2004;34(1):75. [Editor's Notes: Presents the title study, with comparison against existing methods. Contact: GB Ehefnawey, Tanta Univ, Fac Sci, Dept Chem, El Bahr St, Tanta 31572, Egypt.]
  9. Armellin S, Brenna E, Fronza G, Fuganti C, Pinciroli M, Serra S. **Establishing the synthetic origin of amphetamines by H-2 NMR spectroscopy.** *Analyst* 2004;129(2):130. [Editor's Notes: The title study was applied to nine samples of N-acetyl-MDA. Contact: E Brenna, Politecn Milan, Dipartimento Chim Mat Ingn Chim, Via Mancinelli 7, I-20133 Milan, Italy.]
  10. Zimmerman MM. **The identification of 5-methoxy-alpha-methyltryptamine.** *Microgram Journal* 2003;1(3-4):158. [Editor's Notes: Presents the title analysis (using color tests and GC/MS). Contact: [zimmermanmm-at-doj.state.wi.us](mailto:zimmermanmm-at-doj.state.wi.us) ]
  11. Chan KB, Chong YK, Nazarudin M. **The identification of N,N-dimethylamphetamine (DMA) in an exhibit in Malaysia.** *Microgram Journal* 2003;1(3-4):162. [Editor's Notes: Presents the title analysis, using color tests, GC/MS, FTIR, HPLC, melting point, and optical rotation. Contact: [kbchan-at-kimia.gov.my](mailto:kbchan-at-kimia.gov.my) ]
  12. Makino Y, Kurobane S, Miyasaka K, Nagano K. **Profiling of Ecstasy tablets seized in Japan.** *Microgram Journal* 2003;1(3-4):169. [Editor's Notes: Presents the title study, focusing on tablets seized during the first half of CY-2002. Several trends are reported. Contact: [ymakino-at-mbe.nifty.com](mailto:ymakino-at-mbe.nifty.com) ]
  13. Sarwar M, McDonald JL. **A rapid extraction and GC/MS methodology for the identification of psilocyn in mushroom/chocolate concoctions.** *Microgram Journal* 2003;1(3-4):177. [Editor's Notes: Presents the title study. Contact : [msarwar36-at-yahoo.com](mailto:msarwar36-at-yahoo.com) ]
  14. Waumans D, Bruneel N, Hermans B, Tytgat J. **A rapid and simple GC/MS screening method for 4-methoxyphenol in illicitly prepared 4-methoxyamphetamine (PMA).** *Microgram Journal* 2003;1(3-4):184. [Editor's Notes: Presents the title study. 4-Methoxyphenol is a marker compound for syntheses of PMA starting from anethole. Contact: [jan.tytgat-at-pharm.kuleuven.ac.be](mailto:jan.tytgat-at-pharm.kuleuven.ac.be) ]
  15. Geer LC, Hays PA. **Letrozole (Femara®)** *Microgram Journal* 2003;1(3-4):190. [Editor's Notes: Presents analytical data (GC/MS, FTIR, and NMR) for the title compound. Contact: [lois.c.geer-at-usdoj.gov](mailto:lois.c.geer-at-usdoj.gov) ]
  16. Coyle HM, Palmbach T, Juliano N, Ladd C, Lee HC. **An overview of DNA methods for the identification and individualization of marijuana.** *Microgram Journal* 2003;1(3-4):196.

[Editor's Notes: Presents the title overview and review. Note that this article is an authorized reprint from the *Croatian Medical Journal* 2003;44(3):315. Contact: [c4ensic-at-yahoo.com](mailto:c4ensic-at-yahoo.com) ]

17. Bono JP. **Report of the Scientific Working Group for the Analysis of Seized Drugs (SWGDRUG) Conference (Montreal).** *Microgram Journal* 2003;1(3-4):208. [Editor's Notes: Presents the collective results of the title conference. Contact: [jpbslmo@erols.com](mailto:jpbslmo@erols.com) ]

#### Additional References of Possible Interest:

1. Mi J-Q, Zhang X-X, Chang W-B. **Determination of morphine by capillary zone electrophoresis immunoassay combined with laser-induced fluorescence detection.** *Journal of Immunoassay & Immunochemistry* 2004;25(1):57. [Editor's Notes: Presents a competitive immunoassay for detecting morphine in biological samples. Contact: College of Chemistry and Molecular Engineering, Department of Chemical Biology, The Key Lab of Bioorganic Chemistry and Molecular Engineering, Peking University, Beijing.]
2. Murray RA, Doering PL, Boothby LA, Merves ML, McCusker RR, Chronister CW, Goldberger BA. **Putting an Ecstasy test kit to the test: Harm reduction or harm induction?** *Pharmacotherapy* 2003;23(10). [Editor's Notes: Presents a critical analysis and evaluation of the DanceSafe Complete Adulterant Screening Kit for Ecstasy®. Contact: Department of Pharmacy Practice, College of Pharmacy, University of Florida, Gainesville, FL, USA (zip code not provided.)]
3. Bravo DT, Harris DO, Parsons SM. **Reliable, sensitive, rapid, and quantitative enzyme-based assay for gamma-hydroxybutyric acid (GHB).** *Journal of Forensic Sciences* 2004;49(2):379. [Editor's Notes: Several assays are presented for detection of GHB in beverages and urine. Contact: SM Parsons, Department of Chemistry and Biochemistry, University of California, Santa Barbara, CA 93106.]
4. Puschel K, Stein S, Stobbe S, Heinemann A. **Analysis of 683 drug packages seized from "body stuffers".** *Forensic Science International* 2004;140(1):109. [Editor's Notes: Presents a short overview of the practice of internal carrying of controlled substances, with a discussion of packaging and drug types, as observed in Hamburg, Germany. Contact: [heinemann-at-uke.uni-hamburg.de](mailto:heinemann-at-uke.uni-hamburg.de) ]
5. Allen WC. **Method of analyzing the constituents of air extracted from the interior of a piece of luggage.** U.S. Pat. Appl. Publ. US 20040035185 A1 26 Feb 2004, 17 pp. CLASS: ICM: G01N033-22. NCL: 073031020; 073863810. APPLICATION: US 2002-224688 21 Aug 2002. [Editor's Notes: The title technique is presented. The primary application is for explosives, but the technique can be applied to drugs. Contact: USA (no further addressing information was provided.)]
6. Moeller MR. **Forensic conclusiveness and quality assurance of toxicological results.** *Research in Legal Medicine* 2003;30:55. [Editor's Notes: An overview of the legal consequences of toxicological analyses. This article is written in German. Contact: Institut fuer Rechtsmedizin, Universitaet des Saarlandes, Homburg 66421, Germany.]
7. Al-Amri AM, Smith RM, El-Haj BM, Juma'a MH. **The GC-MS detection and characterization of reticuline as a marker of opium use.** *Forensic Science International*

- 2004;140(2-3):175. [Editor's Notes: Reticuline was detected as its trimethylsilylethers, acetyl esters, and methyl ethers, in opium and in the urine of opium users. The results can be used to differentiate between opium and heroin users. Contact: Sharjah Police Forensic Science Laboratory, P.O. Box 29, Sharjah, United Arab Emirates.]
8. Lora-Tamayo C, Tena T, Rodriguez A, Moreno D, Sancho JR, Ensenat P, Muela F. **The designer drug situation in Ibiza.** Forensic Science International 2004;140(2-3):195. [Editor's Notes: Presents a survey of designer drugs used on Ibiza Island, based on analyses of urine and serum samples. Contact: Ministerio de Justicia, Instituto Nacional de Toxicologia, C/ Luis Cabrera 9, Madrid 28002, Spain.]
  9. Brazier JS, Morris TE, Duerden BI. **Heat and acid tolerance of Clostridium novyi Type A spores and their survival prior to preparation of heroin for injection.** Anaerobe 2003;9(3):141. [Editor's Notes: Presents the title study. This study was in followup to the outbreak of clostridium illnesses and deaths in the United Kingdom as a result of the use of contaminated heroin. The results indicate that typical heroin preparation procedures are not adequate to kill the spores. Contact: Department of Medical Microbiology, PHLS Anaerobe Reference Unit, University Hospital of Wales, Heath Park, UK CF4 4XW.]
  10. Potter GR. **The growth of Cannabis growing: A study of urban Cannabis growers in the north of England.** Report Sheffield University 2002; No. 00189486; pp. 1 - 20. [Editor's Notes: Presents an overview of the homegrown commercial cannabis market in northern England. Contact: Department of Law, Sheffield University, Sheffield, UK.]
  11. Hough M, Warburton H, Few B, May T, Man LH, Witton J, Turnbull PJ. **A growing market. The domestic cultivation of cannabis.** Report Joseph Rowntree Foundation 2003; pp. 1 - 45. [Editor's Notes: Presents an overview of domestic cultivation of cannabis in England and Wales. Contact: Criminal Policy Research Unit, South Bank University, London, UK.]
  12. Palabiyik IM, Dinc E, Onur. **Simultaneous spectrophotometric determination of pseudoephedrine hydrochloride and ibuprofen in a pharmaceutical preparation using ratio spectra derivative spectrophotometry and multivariate calibration techniques.** Journal of Pharmaceutical and Biomedical Analysis 2004;34(3):473. [Editor's Notes: Presents a comparison of five different statistical evaluation methods for the title drug combination. Contact: F Onur, Ankara Univ, Fac Pharm, Dept Analyt Chem, TR-06100 Ankara, Turkey.]
  13. Stone HA, Stroock AD, Ajdari A. **Engineering flows in small devices: Microfluidics toward a lab-on-a-chip.** Annual Reviews in Fluid Mechanics 2004;36:381. [Editor's Notes: Presents an overview of the title topic. Contact: [has-at-deas.harvard.edu](mailto:has-at-deas.harvard.edu) ]

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## NEW EMAIL ADDRESSES NEEDED

The email addresses for the following organizations have returned rejection notices to the *Microgram* Editor for the past three issues of *Microgram Bulletin*, and will therefore be dropped from the subscription list unless a corrected email address is provided by the end of June 2004. Note that the errors include anti-spamming comments, mailbox full messages, and user not found or user unknown messages. The Editor requests your assistance in contacting these organizations, determining if they wish to remain on the *Microgram* subscription e-net, and if so asking them to provide a valid email



address to the Editor at: [microgram\\_editor-at-mailsnare.net](mailto:microgram_editor-at-mailsnare.net)

Corte Suprema de Justicia de la Nacion Argentina, Argentina CP1026

Franklin County Coroners Office, Colombus, Ohio

Probe Scientific, El Cerrito, California

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**The following organization (listed last month) was dropped on 4/30/04:**

Lothian and Borders Police, Edinburgh, Scotland

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## **THE DEA FY - 2004 STATE AND LOCAL FORENSIC CHEMISTS SEMINAR SCHEDULE**

The remaining FY - 2004 schedule for the DEA's State and Local Forensic Chemists Seminar is as follows:

June 14 - 18, 2004

September 20 - 24, 2004

Note that the school is open only to forensic chemists working for law enforcement agencies, and is intended for chemists who have completed their agency's internal training program and have also been working on the bench for at least one year. There is no tuition charge for this course. The course is held at the AmeriSuites Hotel in Sterling, Virginia (near the Washington/Dulles International Airport). A copy of the application form is appended onto the October 2003 issue of *Microgram Bulletin*, and should be mailed to the Special Testing and Research Laboratory (Attention: Pam Smith or Jennifer Kerlavage) at: 22624 Dulles Summit Court, Dulles, VA 20166. For additional information, call 703 668-3337.

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## **EMPLOYMENT OPPORTUNITIES**

### **1. Virginia Department of Criminal Justice Services**

(Third and Final Posting)

**Position:** Forensic Scientist II

**Location:** Roanoke, VA

**Salary Range:** \$39,901 - \$65,540

**Application Deadline:** Open Until Filled

**Duties:** Incumbent will: 1) Use current state-of-the-art methodologies and instrumentation to analyze controlled substances; 2) Prepare Certificates of Analyses on findings for use by the criminal justice system; and 3) Testify in court as a qualified expert for the Commonwealth at criminal proceedings as to the results of laboratory findings. Position requires occasional overnight travel. Employee will provide own transportation as required.

**Qualifications:** Knowledge, skills and abilities: Knowledge of basic theoretical principles and applications of the instrumentation and methodologies used to analyze controlled substances required. Knowledge of laboratory safety procedures; quality assurance/quality control and laboratory practices; instrumental analysis (GC, GC/MS, FTIR, UV) and experience in

forensic drug analysis required. Successful completion of a documented training program and/or demonstration of competency is required. Experience presenting testimony in a court of law, as an expert witness is preferred. Must be able to analyze data, develop sound conclusions, maintain accurate records, and analyze, and solve technical problems. Ability to communicate effectively orally and in writing required. A baccalaureate degree in chemistry or other related science with sufficient chemistry courses is required; graduate degree is preferred. Valid driver's license and/or other means of reliable transportation required.

**Application Procedures:** Applicants must submit a state application (#10-012). Applications may be mailed to the Department of Criminal Justice Services, 805 East Broad Street, 10th Floor, Richmond, VA 23219, ATTN: Human Resource Office; emailed to: [gcolburn-at-dcjs.state.va.us](mailto:gcolburn-at-dcjs.state.va.us) or faxed to 804-786-6484. State application forms may be obtained by calling (804) 786-4246 or by downloading the form from the employment section of the DCJS web page at [www.dcjs.org](http://www.dcjs.org) For assistance, call Gene Colburn at (804) 786-6925.

AN EQUAL OPPORTUNITY EMPLOYER

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## SCIENTIFIC MEETINGS

**1. Title:** 14<sup>th</sup> Annual CLIC Training Seminar (First Posting)  
**Sponsoring Organization:** Clandestine Laboratory Investigating Chemists Association  
**Inclusive Dates:** September 8 - 11, 2004  
**Location:** Portland Marriott Downtown; Portland, OR  
**Contact Information:** Pam Smith, 703/668-3337, [auk.ling-at-verizon.net](mailto:auk.ling-at-verizon.net) and Roger Ely, 415/744-7051, [rogely-at-atdial.net](mailto:rogely-at-atdial.net)  
**Website:** [None]

\* \* \* \* \*

**2. Title:** SWAFS Fall Conference (Second Bimonthly Posting)  
**Sponsoring Organization:** Southwestern Association of Forensic Scientists  
**Inclusive Dates:** October 11 - 15, 2004  
**Location:** Oklahoma City, OK  
**Contact Information:** Brandy Reese, 405/425-3857, [brandyr-at-osbi.state.ok.us](mailto:brandyr-at-osbi.state.ok.us)  
**Website:** [[www.swafs.us](http://www.swafs.us)]

\* \* \* \* \*

**3. Title:** Joint Meeting of the Southern Association of Forensic Scientists, the Midwestern Association of Forensic Scientists, the Mid-Atlantic Association of Forensic Scientists, and the Canadian Society of Forensic Science (Second Bimonthly Posting)  
**Sponsoring Organization:** Southern Association of Forensic Scientists  
**Inclusive Dates:** September 19 - 24, 2004  
**Location:** Lake Buena Vista, FL  
**Contact Information:** David Baer, 407/650-5152, [davidb7818-at-aol.com](mailto:davidb7818-at-aol.com); Mike Healy 941/747-3011, Ext. 2280, [mike.healy-at-co.manatee.fl.us](mailto:mike.healy-at-co.manatee.fl.us)  
**Website:** [[www.southernforensic.org](http://www.southernforensic.org)]

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# Computer Corner

## Estimates of Uncertainty

# #182

by Michael J. Phelan  
DEA Digital Evidence  
Laboratory

Proper scientific measurements include an estimate of precision. All instruments have measurable errors. For example, a balance may describe the weight of an item as 32.05 grams, plus or minus 0.01 grams. The first value is the measured weight and the second value is the range of uncertainty in that measurement. These estimates are usually based either on a manufacturer's testing, or a user's independent calibration against a series of documented standards. Knowing the estimate of error is "good science", since real world decisions are often based on both the measurement and its corresponding uncertainty.

As a forensic science discipline, Digital Evidence also needs to consider if individual measurements or the entire examination process have quantifiable estimates of uncertainty. As defined by the Scientific Working Group on Digital Evidence (SWGDE), Digital Evidence is "information of probative value that is stored or transmitted in binary form." Binary data is often described as opposite discrete states of magnetic flux, in other words, the proverbial "on/off" state. Therefore, there wouldn't appear to be any question or uncertainty in such measurements, and no apparent need to estimate uncertainty. However nothing in scientific measurement is simple

- and that includes the recording and copying of binary data.

Consider the following three issues:

First, all binary data is stored either as a magnetic flux (on hard drives, diskettes, and tapes) or optical reflectivity (on CD's, DVD's, and magnet-optical disks). Detection of these recorded states is an analog measurement made by a "read head", as dictated by its controller logic settings. Recognition of an "on" state is an analog electronic measurement, the criteria for which can vary from manufacturer to manufacturer. Additionally, magnetic flux deteriorates as a function of time (as many tape archivists can attest); this is the so-called magnetic historisis effect.

Second, hard drive read heads and optical laser read heads can themselves degrade over time. The decreasing sensitivity of the read head to detect or discriminate between an "on" from an "off" state diminishes the device's ability to consistently and accurately read stored data.

Third, a data storage controller logic circuit or operating system may detect a bad block of data at any time and declare the data storage area as invalid, thereby

eliminating it from all user access and computational activity. In other words, the data stored within the block marked as "bad" becomes inaccessible to the user. A "bad" sector may be the result of only one bit in one byte being undetectable by the read head. [If necessary, the remaining data in the block may be recovered using advanced recovery techniques.] Other blocks of data may be inherently inaccessible due to limits placed on the hard drive controller by the manufacturer. Access to such data storage areas, commonly referred to as "reserved or unreferenced" blocks, is possible but difficult. These blocks provide a relatively discrete area to hide data.

### Data Copying Uncertainty Estimation

Standard digital evidence examinations are usually preceded by the copying of the original evidence for both analysis and archive purposes. A technique known as hashing has been developed to establish if a copy is the same as the original from which it was made.

A hash is a summary output of a standardized mathematical equation or algorithm that is designed to compare the binary pattern in one object with the binary pattern in a second object. The entire binary content of the

object that is to be measured (sector, cluster, file, directory, partition or hard drive) is fed into the hash algorithm and a resulting summary value is produced. The assertion that a copy is authentic is based on comparing the hash value of the original data with the hash value of the copy. If the hash values are identical, the copy is considered to be an exact duplicate. Currently, most digital evidence examiners use a computer security industry standard hash algorithm known as MD-5 (developed in 1994 by Dr. Ronald L. Rivest of the Massachusetts Institute of Technology). This algorithm produces a 128-bit value as its output. Consequently, an assertion that a copy is authentic based on a MD-5 hash is actually a probabilistic assessment that the chance of two different data sets having the same hash value would be approximately 1 in  $2^{128}$  (i.e., an incredibly large number, meaning an incredibly small chance). An even more exacting hash algorithm is the SHA-1 algorithm, which calculates the hash value of the target binary data set to a value of  $2^{160}$ . SHA-1 was developed by the U.S. National Institute of Standards. DEA currently uses the MD-5 algorithm because the calculation times are shorter than SHA-1, and it is generally accepted as the present standard in digital evidence forensics.

The importance of hashing in the digital evidence acquisition process is to statistically demonstrate that it is virtually impossible to produce two sets of data having the same hash

value. Consequently, the probability estimates inherent in the hash algorithm define the estimate of uncertainty in the digital evidence duplication phase.

### **Overall Examination Uncertainty Estimation**

Estimating the uncertainty for the digital evidence examination process is based on the software's performance and the examiner's knowledge, skills, and ability. The former is tested during: 1) Methods validation; 2) Use of examination controls; and 3) Instrument monitoring. The examiner expertise is also evaluated in numerous ways, including: 1) Peer review; 2) Technical and administrative reviews; and 3) Internal, external, and blind proficiency testing.

Quantitative estimates of both errors of omission as well as errors of commission need to be undertaken in order to enable courts and jurors to assess the merits of the digital data that is presented. To date, no such studies have been published. The discipline of digital evidence is still relatively new, and the scopes of examination differ widely, making a single estimate of uncertainty for the discipline a difficult undertaking. Both government and academia need to address this issue, as the importance of digital evidence as a forensic technique gains in acceptance by both investigators and the courts.

Questions or comments?  
E-mail: [mphelelan-at-erols.com](mailto:mphelelan-at-erols.com)

# Microgram

## *Bulletin*

Published by:

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Office of Forensic Sciences  
Washington, DC 20537

The U.S. Attorney General has determined that the publication of this periodical is necessary in the transaction of the public business required by the Department of Justice. Information, instructions, and disclaimers are published in the January issues.

**VOL. XXXVII, NO. 6**

**JUNE 2004**

### **- INTELLIGENCE ALERT -**

#### **70,000 PSILOCYBIN MUSHROOM/CHOCOLATE CANDIES SEIZED NEAR AMARILLO, TEXAS**

The Texas Department of Public Safety Crime Laboratory Service in Amarillo (Amarillo, Texas) recently received a submission of approximately 70,000 chocolate candies (total net mass 154 kilograms), suspected psilocybin mushroom/chocolate concoctions. The exhibits were seized



**Photo 1**



**Photo 2**

by the Texas State Highway Patrol pursuant to a vehicle stop on I-40, just west of Amarillo (the vehicle was travelling from California to Tennessee). The candies were being stored in the vehicle's trunk in trash bags, under what appeared to be a space blanket, and were furthermore being cooled by dry ice (see Photos 1 and 2, previous page). There were two, rather indistinct designs - a fish, and a cameo (see Photos 3 and 4). Microscopic examination of a crushed sample revealed a large amount of finely ground, mushroom-like material mixed into the chocolate. Analysis of this material by TLC, UV, and GC/MS confirmed psilocin (quantitation not performed). This was the laboratory's first encounter with psilocybin mushroom/chocolate candies, and in fact was the first encounter with any adulterated form of psilocybin mushrooms. The laboratory's largest previous submission of psilocybin mushrooms was just over seven kilograms.

[Editor's Notes: This appears to be the largest seizure of psilocybin mushroom/chocolate concoctions ever reported. The phenomenon of psilocybin mushroom/chocolate concoctions was discussed at length in the June, 2003 issue of *Microgram Bulletin* (with additional reports also being published in the May, August, and October 2003 issues of *Microgram Bulletin*). A specialized forensic analysis for these concoctions was published in *Microgram Journal* 2003;1(3-4):177.]

\* \* \* \* \*

### **- INTELLIGENCE ALERT -**

#### **VIAGRA® MIMIC TABLET CONTAINING AMPHETAMINE IN FEJER COUNTY, HUNGARY**

The Institute for Forensic Sciences National Drug Laboratory (Budapest, Hungary) recently received 9,000 white Ecstasy tablets with a "Euro" logo (see Photo 5), and also one pink, rhombus-shaped tablet, net mass 0.30 gram, with a Pfizer imprint on one side and a VGR50 imprint on the other side (see Photos 6 and 7, next page), an apparent Viagra® counterfeit. The exhibits were seized pursuant to a vehicle search by the County Police in Fejer County, Hungary (located approximately 70 kilometers west of Budapest). Except for the color, the tablet appeared to be a standard tablet of Viagra (genuine Viagra tablets are blue (see authentic tablet in Photos 6 and 7)). Analysis by GC/MS and HPLC, however, indicated not sildenafil citrate (Viagra) but rather 15 milligrams of amphetamine (isomer and salt form not reported). Analysis of the suspected Ecstasy tablets confirmed MDMA (no further details). Although the laboratory has



**Photo 3**



**Photo 4**



**Photo 5**





**Photo 6**



**Photo 7**

previously encountered genuine Viagra tablets in seizures of Ecstasy, this was the first submission of a Viagra mimic tablet containing amphetamine.

[Editor's Notes: Viagra is often sold in conjunction with MDMA in order to help users compensate for the reduced sexual performance that is a common side-effect resulting from abuse of MDMA. This appears to be the first ever report of a counterfeit Viagra tablet to *Microgram Bulletin*.]

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### **- INTELLIGENCE ALERT -**

#### **LOLLIPOPS CONTAINING $\Delta^9$ -TETRAHYDROCANNABINOL AND PHENCYCLIDINE IN CHICAGO, ILLINOIS**

The Illinois State Police Forensic Science Center at Chicago (Chicago, Illinois) recently received two submissions containing a total of 55 lollipops, suspected to contain a controlled substance, possibly MDMA, THC, or GHB. The lollipops were being sold on the West Side of Chicago, and were seized by the Chicago Police Department. Analysis was prioritized because the items were apparently being marketed to children. Each lollipop weighed approximately 10 grams, and were either green, red, or amber colored, and were in the shape of a maple leaf (see Photo 8)



**Photo 8**



**Photo 9**

or an indistinct face resembling Santa Claus (see Photo 9, previous page). No visible plant material was observed; however, a crushed portion tested positive for  $\Delta^9$ -tetrahydrocannabinol (THC) with the Duquenois-Levine test. Analysis by GC and GC/MS indicated a mixture of THC and phencyclidine (PCP) (quantitation not performed). This was the laboratory's first submission of this type.

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**- INTELLIGENCE ALERT -**

**LARGE ELECTRONIC CAPACITORS CONTAINING HEROIN  
IN PHILADELPHIA, PENNSYLVANIA**

The DEA Northeast Laboratory (New York, New York) recently received a submission of nine large capacitors, each containing a tan powder, suspected heroin (see Photo 10). The capacitors were originally attached to a circuit board (nominal purpose unknown), that had been shipped as air freight from Venezuela to Philadelphia, Pennsylvania, that was seized by Immigration and Customs Enforcement Inspectors from the Philadelphia Office. Analysis of the powder (total net mass 493.7 grams) by GC/FID, GC/MS, and FTIR confirmed 80 percent heroin hydrochloride. This was the first submission of this type to the laboratory; however, two additional circuit boards with capacitors containing heroin have been received since this initial encounter.



**Photo 10**

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**- INTELLIGENCE ALERT -**

**ONCE REMOVED® NAIL POLISH REMOVER (CONTAINING GBL)  
SEIZED IN METAIRIE, LOUISIANA**

The DEA South Central Laboratory (Dallas, Texas) recently received a submission of two bottles of "Once Removed" nail polish remover and treatment, each containing 30 milliliters of a clear, oily liquid, submitted as unknowns (see Photo 11, next page). Although the packaging appears to be professional, the labelling does not list the ingredients, company name, or company contact information. The DEA New Orleans office seized the exhibits at a suspected *gamma*-hydroxybutyric acid (GHB) clandestine laboratory in Metairie, Louisiana. Analysis of the liquid by HPLC and GC/MS indicated *gamma*-butyrolactone (GBL) (not quantitated, but

apparently pure or nearly pure). The laboratory was apparently a prescription drug diversion operation, re-selling various substances over the Internet. There were about a dozen empty bottles of “Once Removed” at the site; the operators were allegedly diluting one bottle into a one liter bottle of Fruit Punch flavored Powerade for resale. While GBL is not an uncommon submission to the laboratory, this is the first exhibit of “Once Removed” nail polish remover.



**Photo 11**

[Editor's Notes: “Once Removed” is a product of SMS Laboratories in Brooklyn, New York, and is very well known in the GHB abusing community as a source of high purity GBL. The above seizure is unusual because neither the company or product ingredients are listed on the packaging. It is unknown why this information was not included on the packaging in this case.]

\* \* \* \* \*

### **- INTELLIGENCE ALERT -**

### **NESTLE SUPLIGEN® CANS CONTAINING LIQUID COCAINE IN PLANTATION, FLORIDA**

The DEA Southeast Laboratory (Miami, Florida) recently received seven commercially labelled cardboard boxes containing 288 cans of Nestle's Supligen® (a dietary supplement drink), suspected to contain solutions of cocaine (see Photo 12). The exhibits were seized from a storage facility in Plantation by agents from the DEA Fort Lauderdale District Office (Plantation is located just west of Fort Lauderdale). Ninety two of the cans contained a thick, clear liquid (total net mass 38.66 kilograms (total net volume 31.69 liters)) that screened positively for cocaine. Analysis by GC, FTIR, and GC/MS confirmed a mixture of cocaine hydrochloride (753 mg/mL) and phenacetin (not quantitated). This was the first submission of liquid cocaine in cans of Supligen to the laboratory.



**Photo 12**

**- INTELLIGENCE ALERT -**

**LOLLIPOPS CONTAINING HEROIN IN NEW YORK, NEW YORK**

The DEA Northeast Laboratory (New York, New York) recently received a submission of thirty-one lollipops with loose wrappers, suspected to contain heroin (see Photo 13). The exhibits were seized at LaGuardia airport by the DEA New York Field Division (circumstances not provided). The wrappers indicated only the flavor of the candy (peach, watermelon, sour, etc.) The pops varied from 3/4's of an inch to one inch in diameter, and (unusually) consisted of a candy shell surrounding a powder interior (see Photo 14). Analysis of the powder (total net mass 520.1 grams) by GC/FID, GC/MS and FTIR confirmed 64 percent heroin hydrochloride. This is the first submission of lollipops containing heroin powder to the laboratory; however, the laboratory has previously received lollipops containing cocaine hydrochloride.



**Photo 13**



**Photo 14**

\* \* \* \* \*

**- INTELLIGENCE ALERT -**

**SENTRON® FIRE EXTINGUISHERS CONTAINING COCAINE  
IN NOGALES, ARIZONA**

The DEA Southwest Laboratory (Vista, California) recently received a submission of six small Sentron® fire extinguishers, each containing a packed white powder, suspected cocaine (see Photos 15 and 16, next page). The exhibits were seized from three different cars in Nogales by Agents from the DEA Tucson Resident Office. The cannisters were labeled in Spanish, and the pressure gauges indicated that the extinguishers were at least partially full; however, none were actually under pressure. The nozzle portions on all six cannisters could be unscrewed; however, removal of the contents required a power saw to cut the cannister open. Analysis of the powder (total net mass approximately 12 kilograms) by GC, IR, and MS confirmed cocaine hydrochloride (average purity approximately 90 percent). This was the laboratory's first encounter with this particular smuggling technique.





**Photo 15**



**Photo 16**

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**- INTELLIGENCE ALERT -**

**OKLAHOMA FIRST STATE TO BAN OVER-THE-COUNTER SALES  
OF PSEUDOEPHEDRINE TABLETS**

[From the NDIC *Narcotics Digest Weekly* 2004;3(17):3  
Unclassified, Reprinted with Permission.]

On April 6, 2004, the governor of Oklahoma signed into law a bill prohibiting over-the-counter sales of tablets containing pseudoephedrine, a precursor chemical used in the production of methamphetamine. The law designates cold and allergy tablets containing pseudoephedrine as a Schedule V substance that can be sold only by licensed pharmacists or licensed pharmacy technicians. Consumers will be required to present valid photo identification and sign a logbook to purchase the drugs. The law also limits the amount a person can buy or possess to 9 grams (approximately 10 boxes of cold tablets). Any person convicted of violating the provisions of the law faces up to 1 year in jail and/or a \$1,000 fine for a first offense (misdemeanor) and a \$5,000 fine and a term of imprisonment of not more than 5 years for a second offense (felony). Consumers will still be able to purchase gel cap and liquid forms of the drugs over the counter.

*NDIC Comment:* Other states, including Missouri and Iowa, have enacted legislation designed to restrict grocery and discount store sales of pseudoephedrine products by requiring that the drugs be placed behind the counter or within sight of clerks. However, Oklahoma is the first state to ban sales of cold and allergy tablets with pseudoephedrine in stores other than pharmacies and to control the sale and the amount of the sale of such products.

**- INTELLIGENCE ALERT -**

**LOLLIPOP-SHAPED FENTANYL PRODUCTS DIVERTED  
IN EASTERN PENNSYLVANIA**

[From the NDIC *Narcotics Digest Weekly* 2004;3(20):1  
Unclassified, Reprinted with Permission.]

Law enforcement officials with the Philadelphia Division of the Drug Enforcement Administration (DEA), Philadelphia Police Department, and Carbondale Police Department report increasing diversion and distribution of a prescription pain reliever known as ACTIQ (oral transmucosal fentanyl citrate). ACTIQ contains a form of fentanyl - a synthetic opiate that possesses an analgesic potency approximately 80 times stronger than morphine. The U.S. Food and Drug Administration (FDA) approved ACTIQ in November 1998 for the management of cancer pain for patients with malignancies who had already received and had become tolerant to opioid therapy. ACTIQ, one of several fentanyl products available by prescription, is distributed as a medicated raspberry-flavored lozenge attached to a short handle resembling a lollipop. As the medicated lozenge dissolves, the active ingredient (fentanyl citrate) is absorbed through the lining of the mouth. ACTIQ is intended only for those already on an opioid-based pain management program.

*NDIC Comment:* The diversion and abuse of ACTIQ likely will increase because of individuals seeking the effects of its active ingredient, fentanyl citrate. The lollipop-like administration of the drug is likely to appeal to users who would be hesitant to take a fentanyl tablet, snort fentanyl powder, or inject the drug. Moreover, other fentanyl products, particularly a fentanyl transdermal patch known as Duragesic, already is frequently diverted and abused in many areas. In fact, National Drug Threat Survey 2003 data indicate that 10.2 percent of law enforcement agencies responding nationwide report that fentanyl is commonly diverted and illicitly used in their areas. Law enforcement agencies in the Northeast/Mid-Atlantic (12.0%), Pacific (11.6%), and West Central (10.9%) regions report the highest percentages of fentanyl diversion and abuse. DEA officials in Philadelphia report that ACTIQ, referred to as perc-a-pop, is being sold in the city for \$20 per dosage unit.

[Editor's Note: For a photo of an ACTIQ lollipop, see: *Microgram Bulletin* 2004;37(3):49.]

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**- INTELLIGENCE ALERT -**

**MDMA LABORATORY SEIZED IN MARION [SOUTH DAKOTA]**

[From the NDIC *Narcotics Digest Weekly* 2004;3(20):3  
Unclassified, Reprinted with Permission.]

On April 27, 2004, officials from the DEA Sioux Falls Resident Office and Sioux Falls Police Department Drug Task Force seized an operational MDMA laboratory from a Marion residence



and arrested a 39-year-old female and a 25-year-old male on charges of attempting to manufacture MDMA and aiding and abetting the manufacture of MDMA. The arrests and seizure were the result of a 3-month investigation conducted to determine the identity of the intended recipients of chemicals being sent to a Sioux Falls post office box. The defendants allegedly purchased chemicals and glassware to manufacture MDMA (3,4-methylenedioxy-methamphetamine, also known as ecstasy) through a fictitious company via the Internet and by telephone from companies in California, North Carolina, Ohio, Texas, and the Netherlands. The chemicals, including ether and sassafras oil, and glassware were delivered to the post office box in Sioux Falls. Prior to their arrests, the defendants allegedly produced three batches of MDMA, each weighing approximately 4 grams. According to law enforcement officials, the powdered MDMA was placed in capsules and distributed to individuals at rave parties in Midwest cities such as Chicago and Kansas City for \$20-\$25 per capsule. Law enforcement officials also seized 4 grams of MDMA, psilocybin mushrooms, marijuana, and \$2,500 from the Marion residence. The DEA, Sioux Falls Police Department Drug Task Force, South Dakota Highway Patrol, Turner County Sheriff's Office, U.S. Postal Inspection Service (USPS), Bureau of Alcohol, Tobacco, Firearms, and Explosives (ATF), Mitchell Police Department, and Yankton Police Department participated in the investigation.

*NDIC Comment:* Law enforcement officials in South Dakota report that this is the first MDMA laboratory seizure in the state. Very few MDMA laboratories are seized each year in the United States. According to DEA El Paso Intelligence Center (EPIC) National Clandestine Laboratory Seizure System data, law enforcement agencies report 3 domestic MDMA laboratory seizures in 2003 compared with 10 seizures in 2002. In 2003 law enforcement officials seized 1 MDMA laboratory each in Florida, Louisiana, and Texas.

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## **- INTELLIGENCE BRIEF -**

### **DIPROPYLTRYPTAMINE AND 2C-I IN PORTLAND, OREGON**

The Oregon State Police Crime Lab (Portland, Oregon) recently received two unusual drug submissions from the Portland Police Bureau. The first was a vial of tan powder (total net mass 3.9 grams), commercially (but crudely) labelled as “N,N-Dipropyltryptamine”(photo not available). The label also included the CAS number, warning information, and numbers presumably related to inventory or production batch. The vial was turned over to the Portland Police Bureau by the security personnel for an express mail service. Analysis of the powder by color testing (Webers and PDMAB), GC/MS, FT-IR, and UV gave results consistent with dipropyltryptamine (DPT) (not quantitated, but only one peak by GC). However, the results were also consistent with N,N-diisopropyltryptamine (DIPT), and since the laboratory did not have reference standards for either compound, the identification was tentative.

The second submission was a pharmacy-style bottle containing four gel-caps, each containing a small amount of fluffy white crystalline substance (total net mass of powder less than 10 milligrams), identity unknown but suspected to be an illicit drug (photo not available). The exhibit was part of a polydrug seizure from an individual in Portland who was arrested for failure

to appear for previously filed, unrelated drug charges. Analysis by color testing (Marquis), GC/MS, FT-IR, and UV indicated 4-iodo-2,5-dimethoxyphenethylamine (2C-I).

These were the first submissions of DPT (DIPT) or 2C-I to the laboratory.

\* \* \* \* \*

## SELECTED REFERENCES

[Notes: Selected references are a compilation of recent publications of presumed interest to forensic chemists. Unless otherwise stated, all listed citations are published in English. If available, the email address for the primary author is provided as the contact information. Listed mailing address information (which is sometimes cryptic or incomplete) exactly duplicates that provided by the abstracting services. In addition, in order to prevent automated theft of email addresses off the Internet postings of *Microgram Bulletin*, unless otherwise requested by the corresponding author, all email addresses reported in the *Bulletin* have had the “@” character replaced by “-at-”; this will need to be converted back (by hand) before the address can be used.]

1. Borngasser J. **Lab supplies go to the highest bidder: A brief analysis of clandestine methamphetamine laboratory supplies and methamphetamine precursors being sold on ebay®.** Journal of the Clandestine Laboratory Investigating Chemists Association 2004;14(2):8. [Editor's Notes: Presents an overview of the title topic. Note that *JCLICA* is a law enforcement restricted journal. Contact: Oregon State Police Forensic Laboratory, Central Point, OR (street address and zip code not provided).]
2. Dimitroff D. **Psilocybin mushroom cultivation.** Journal of the Clandestine Laboratory Investigating Chemists Association. 2004;14(2):11. [Editor's Notes: Presents an overview of the title topic. Note that *JCLICA* is a law enforcement restricted journal. Contact: Peel Regional Police, Morality Bureau (Drug Unit), Mississauga/Brampton, Ontario, Canada (street address and Canadian postal zone code not provided).]
3. Person EC, Knops LA, Northrop DM, Sheridan SP. **“One-pot” methamphetamine manufacture.** Journal of the Clandestine Laboratory Investigating Chemists Association. 2004;14(2):14. [Editor's Notes: Presents an evaluation of an Internet recipe. Note that *JCLICA* is a law enforcement restricted journal. Contact: Washington State Patrol, Marysville Crime Laboratory, 2700 116th Street NE, Suite P, Marysville, WA 98271.]
4. Galand N, Emouf D, Montigny F, Dollet J, Pothier J. **Separation and identification of cannabis components by different planar chromatography techniques (TLC, AMD, OPLC).** Journal of Chromatographic Science 2004;42(3):130. [Editor's Notes: Abstract not provided. Contact: N Garland, Lab Pharmacognosie, UFR Sci Pharmaceut, 31 Ave Monge, F-3720 Tours, France.]
5. Pihlainen K, Kostiaainen R. **Effect of the eluant on enantiomer separation of controlled drugs by liquid chromatography - ultraviolet absorbance detection - electrospray ionisation tandem mass spectrometry using vancomycin and native beta-cyclodextrin chiral stationary phases.** Journal of Chromatography A 2004;1033(1):91. [Editor's Notes: Presents the title study on nine amphetamine derivatives (not specified in abstract), methorphan, and propoxyphene. 14 seized drug samples (not specified in abstract) were analyzed using the

optimized methodologies. Contact: R Kostianen, Univ Helsinki, Vikki Drug Discovery Technol Ctr, POB 56, FIN-00014 Helsinki, Finland.]

6. Van Nimmen NFJ, Veulemans HAF. **Development and validation of a highly sensitive gas chromatographic - mass spectrometric screening method for the simultaneous determination of nanogram levels of fentanyl, sufentanil, and alfentanil in air and surface contamination wipes.** Journal of Chromatography A 2004;1035(2):249. [Editor's Notes: Focus is on sampling for industrial occupational exposure. Technique uses SIM. Contact: NFJ Van Nimmen, Katholieke Univ Leuven, Lab Occupat Hyg & Toxicol, Dept Occupat Environm & Insurance Med, Kapucijnenvoer 35, 6th Floor, B-3000 Louvain, Belgium.]
7. Suzuki Y, Arakawa H, Maeda M. **The capillary electrophoresis separation of benzodiazepine drugs using dextran sulfate and SDS as running buffer.** Biomedical Chromatography 2004;18(3):150. [Editor's Notes: Presents the EKC analysis of 10 benzodiazepines (not specified in abstract). The authors claim that the presented method may also be used for many other pharmaceuticals. Contact: M Maeda, Showa Univ, Sch Pharmaceut Sci, Shinagawa Ku, Tokyo 1428555, Japan.]
8. Sagmuller B, Schwarze B, Brehm G, Trachta G, Schneider S. **Identification of illicit drugs by a combination of liquid chromatography and surface-enhanced Raman scattering spectroscopy.** Journal of Molecular Structure 2003;661-662:279. [Editor's Notes: Presents a novel HPLC-SERS technique for analysis of illicit drugs (not specified in abstract). Contact: PALM Microlaser Technologies AG, D-82347 Bernried, Germany.]
9. Hajdar M, Ruzdic E. **Characterisation of heroin samples obtained in the area of the Federation of Bosnia and Herzegovina.** Journal of Environmental Protection and Ecology 2003;4(4):873. [Editor's Notes: Presents the title survey, using GC/FID analysis to detect 8 opium alkaloids and 3 typical adulterants. The number of samples and the date range were not specified in the abstract. Contact: Forensic Department, Federal Ministry of Internal Affairs, Sarajevo, Bosnia/Herzegovina.]
10. Kite GC, Ismail M, Simmonds MSJ, Houghton PJ. **Use of doubly protonated molecules in the analysis of cathedulins in crude extracts of khat (Catha edulis) by liquid chromatography/serial mass spectrometry.** Rapid Communications in Mass Spectrometry 2003;17(14):1553. [Editor's Notes: Analysis of fresh khat by LC/MS revealed 62 cathedulins. Contact: Royal Botanic Gardens, Kew, Richmond, UK TW9 3AB.]
11. Jones, JJ, Kidwell H, Games DE. **Application of atmospheric pressure chemical ionisation mass spectrometry in the analysis of barbiturates by high speed analytical countercurrent chromatography.** Rapid Communications in Mass Spectrometry 2003;17(14):1565. [Editor's Notes: The title study was performed on 4 barbiturates (barbital, allobarbital, phenobarbital, and butalbital). Contact: Mass Spectrometry Research Unit, University of Wales Swansea, Swansea, UK SA2 8PP.]
12. Galimov EM, Sevast'yanov VS, Kul'bachevskaya EV, Golyavin AA. **Determination of isotopic compositions of carbon and nitrogen by the IRMS method: Implication for the source of narcotic substance origin.** Doklady Earth Sciences 2003;393(8):1109. [Editor's Notes: Presents the title study on cocaine and heroin from different regions. Contact: Vernadsky Institute of Geochemistry and Analytical Chemistry, Russian Academy of Sciences, Moscow, Russia 119991.]

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14. Watanabe S, Shibata M, Kataoka K. **Comparison of data obtained by various GC methods for impurity profiling of stimulant drugs.** Kanzei Chuo Bunsekishoho 2002;42:73. [Editor's Notes: Three different GC methods were used for impurity profiling of 10 typical impurities in 12 samples of stimulant drugs (not specified in abstract). This article is written in Japanese. Contact: Central Customs Laboratory, Ministry of Finance, Chiba, Japan 277-0882.]

#### **Additional References of Possible Interest:**

1. Meatherall R, Sharma P. **Foxy, a designer tryptamine hallucinogen.** Journal of Analytical Toxicology 2003;27(5):313. [Editor's Notes: Primary focus is analysis of biological fluids; however, includes a small scale mass spectra (from GC/MS) of "Foxy" (5-methoxy-*N,N*-diisopropyltryptamine). Contact: R Meatherall, St Boniface Gen Hosp, Lab Med, 409 Tache Ave, Wiinipeg, MB R2H 2A6, Canada.]
2. Curtis B, Kemp P, Harty L, Choi C, Christensen D. **Postmortem identification and quantitation of 2,5-dimethoxy-4-*n*-propylthiophenethylamine using GC-MSD and GC-NPD.** Journal of Analytical Toxicology 2003;27(7):493. [Editor's Notes: Primary focus is analysis of biological fluids and tissue samples; however, includes a small scale mass spectra (from GC/MS) of the title compound (i.e., 2C-T-7). Contact: Office of the Chief Medical Examiner, 901 N. Stonewall, Oklahoma City, OK 73117.]
3. Zhang S, Zhuang YF, Ju HX. **Flow-injection chemiluminescence determination of papaverine using cerium(IV)-sulfite system.** Analytical Letters 2004;37(1):143. [Editor's Notes: The title study is presented; the method is adequate for determination of papaverine in pharmaceuticals and in biological fluids. Contact: HX Ju, Nanjing Univ, Dept Chem, Inst Analyt Sci, State Key Lab Coordinat Chem, Nanjing 210093, Peoples R China.]
4. Vas G, Vekey K. **Solid-phase microextraction: A powerful sample preparation tool prior to mass spectrometric analysis.** Journal of Mass Spectrometry 2004;39(3):233. [Editor's Notes: Presents an overview and review of SPME. Contact: G Vas, Univ Antwerp, Dept Biomed Mass Spectrometry, Univ Plein 1, B-2610 Wilrijk, Belgium.]
5. Derringer B, Leigh T. **Solving problems in ion mobility measurements of forensic samples with thermal desorption and dynamic modeling.** Diss Abstr Int B 2003;64(4):1715. [Editor's Notes: No abstract provided. Contact: Ohio Univ, Athens, OH (no further addressing information provided.)]
6. Schaefer T. **Chemists in criminal technology.** Nachrichten aus der Chemie 2004;52(2):223. [Editor's Notes: A mini-review covering criminalists and forensic chemists. This article is written in German. Contact: Wiesbaden, Germany (no other addressing information was provided.)]
7. Nguyen DH, Berry S, Geblewicz JP, Couture G, Huynh P. **Chemiluminescent detection of explosives, narcotics, and other chemical substances.** U.S. Pat. Appl. Publ. US 20040053421 A1 18 Mar 2004. CLASS: ICM: G01N021-76. NCL: 436172000;436164000; 436117000; 436155000; 436159000; 422052000; 422078000; 422080000;422082050; 422082080.

APPLICATION: US 2002-241407 12 Sep 2002. [Editor's Notes: Presents the title patent. Narcotics not specified in abstract. Contact: Can. (no further addressing information was provided).]

8. Brestel M, Gft M, Sharon U. **Controlled substance detection and identification system.** U.S. Pat. Appl. Publ. US 20040051867 A1 18 Mar 2004. CLASS: ICM: G01J003-44. ICS: G01J003-30. NCL: 356318000; 356301000. APPLICATION: US 2003-428398 2 May 2003. PRIORITY: IL 2002-151745 12 Sep 2002. [Editor's Notes: Presents the title patent. Controlled substances not specified in abstract. Contact: International Technologies (Lasers) Ltd., Israel (no further addressing information was provided).]
9. Zhang H, Tang J, Liu Y, Shao W, Fan X, Qin Y. **Method and test paper for semi-quantitative detection of drugs/medicine by color band-degressive immunological chromatography.** Faming Zhuanli Shenqing Gongkai Shuomingshu CN 1,381,729 (Cl. G01N33/558), 27 Nov 2002, Appl. 2,002,114,110, 30 Apr 2002. [Editor's Notes: The title methodology was applied to over 24 drugs. This patent is written in Chinese. Contact: Changsa Mental Disease Hospital, Peop. Rep. China.]

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## NEW EMAIL ADDRESSES NEEDED

The email addresses for the following organizations have returned rejection notices to the *Microgram* Editor for the past three issues of *Microgram Bulletin*, and will therefore be dropped from the subscription list unless a corrected email address is provided by the end of July 2004. Note that the errors include anti-spamming comments, mailbox full messages, and user not found or user unknown messages. The Editor requests your assistance in contacting these organizations, determining if they wish to remain on the *Microgram* subscription e-net, and if so asking them to provide a valid email address to the Editor at: [microgram\\_editor-at-mailsnare.net](mailto:microgram_editor-at-mailsnare.net)

Beaufort County Sheriff's Office Drug Analysis Laboratory, Beaufort, South Carolina

Delaware Office of the Chief Medical Examiner, Wilmington, Delaware

Mississippi Crime Laboratory / Gulf Coast Branch, Biloxi, Mississippi

Tripura State Forensic Science Laboratory, West Tripura, India

USAF / AFOSI DET 303, Travis AFB, California

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**The following organizations (listed in the May issue) were dropped on 6/30/04:**

Corte Suprema de Justicia de la Nacion Argentina, Argentina CP1026

Probe Scientific, El Cerrito, California

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## THE DEA FY - 2004 STATE AND LOCAL FORENSIC CHEMISTS SEMINAR SCHEDULE

The remaining FY - 2004 schedule for the DEA's State and Local Forensic Chemists Seminar is as follows:

September 20 - 24, 2004

Note that the school is open only to forensic chemists working for law enforcement agencies, and is intended for chemists who have completed their agency's internal training program and have also been working on the bench for at least one year. There is no tuition charge for this course. The course is held at the AmeriSuites Hotel in Sterling, Virginia (near the Washington/Dulles International Airport). A copy of the application form is appended onto the October 2003 issue of *Microgram Bulletin*, and should be mailed to the Special Testing and Research Laboratory (Attention: Pam Smith or Jennifer Kerlavage) at: 22624 Dulles Summit Court, Dulles, VA 20166. For additional information, call 703 668-3337.

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### SCIENTIFIC MEETINGS

**1. Title: 14<sup>th</sup> Annual CLIC Training Seminar**

(Second Posting)

**Sponsoring Organization:** Clandestine Laboratory Investigating Chemists Association

**Inclusive Dates:** September 8 - 11, 2004

**Location:** Portland Marriott Downtown; Portland, OR

**Contact Information:** Pam Smith, 703/668-3337, [auk.ling-at-verizon.net](mailto:auk.ling-at-verizon.net) and Roger Ely, 415/744-7051, [rogely-at-atdial.net](mailto:rogely-at-atdial.net)

**Website:** [None]

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# Computer Corner

## Virtual Processing

# #183

by Michael J. Phelan  
DEA Digital Evidence  
Laboratory

Virtual processing is the simulation of a computer operating system or application program within a real world computer under the control of the host computer's operating system. Virtual processing enables multiple applications to operate in an isolated operating system environment. It also compartmentalizes processes, and can therefore minimize program failures that can stop an entire computer system.

To date, virtual processing has been primarily used in main frame computers, but not with personal computers, due to limitations with PC hardware and operating system architectures. Virtual processing requires extensive computing resources, including fast processor speeds, robust operating system architectures (that support multiple concurrent processing), and fast computer memory management. However, recent advances in these technologies have increased its potential for use in PC's, including for digital evidence examination purposes. In the latter case, potential benefits include reduced examination times and fewer examination computers.

The principal benefit of virtual processing is eliminating the need to run concurrent computer systems in order to view certain

types of data. Most digital evidence forensics are conducted using a "forensic platform" such as Access Data's Forensic Tool Kit (FTK), Guidance Software's Encase, or the U.S.

Government's Ilook licensed software. These platforms use standard data recovery techniques such as erased file recovery or keyword searching, and are highly effective with routine programs and files. However, there is often a need to run specialized programs in order to view proprietary types of binary data, especially where the data is not stored in a standard ASCII format (that is, that common file browsers can interpret and display). Applications such as financial accounting data and pharmacy transactional data frequently utilize proprietary data storage formats that cannot be viewed using any of the standard digital evidence forensic examination platforms.

In other instances, the ability to view the desktop display of a computer helps the examiner identify the application programs that are important to the computer user. For example, short cuts to ISP's (AOL, MSN, Hotmail, or Yahoo), or frequently used applications such as Quicken, or critical data files such as an Excel spreadsheet. Recovery of these data types requires that a

bootable work copy of the hard drive be created in order to run the user's operating system and/or application software.

Virtual processing offers the potential to eliminate the extra steps involved in creating and mounting such bootable work copies. It can take a day or more to create and successfully mount such copies in a different computer hardware environment – a very significant amount of time for any examiner.

Application of virtual processing to the examination of digital evidence is therefore an important evolutionary advance. To date, there have been five such advances, as follows:

### Generation One

Initially, digital evidence was regarded as a static collection of digital data files or fragments of user or computer system generated data. This static data was viewed as objects that could be viewed (browsed) or searched using text string search engines. Use of digital evidence forensic tools permitted analysis without changing any of the data. This has always been a digital evidence forensic best practice.

### Generation Two

The second generation of digital evidence forensic techniques improved on the initial, purely static examination approach by

utilizing enhanced technical evidence duplication capabilities to create bootable work copies. Reviews are conducted by running a copy of the user's operating system and/or application program. Creating a bootable work copy is a well accepted digital evidence forensic practice that supplements static browsing and keyword searching. However, the technique is limited to viewing application output only, because it changes some file date/time stamps, and also overwrites data in the temporary work files that are managed by the operating system. Therefore, a completely separate examination of a second work copy is often necessary to browse and keyword search other areas of the evidence. This can result in a lengthy examination process.

### **Generation Three**

The third generation of evidence copying technology is known as "imaging". Images are files that can be mounted within a "digital evidence forensic platform". The image files contain an accurate representation of the original evidence, as well as embedded data required for data authentication purposes. In contrast to bootable work copies, image files are not hardware dependent. However, digital evidence examination of images is limited to viewing data in a format that precludes assessment of the user's desktop, or the running of application programs. This can be a significant problem in certain types of cases where the computer user's most commonly accessed programs and/or files are displayed on the

desktop, or where specialized programs are needed to access data (for example, financial accounting software frequently needs to be run in order to fully understand data stored in credit and debit columns).

### **Generation Four**

The fourth generation consists of "emulation" technology, which is an application program that gives the appearance that a computer is operating within a computer. One simple example of an emulation program is the use of a Microsoft DOS command line prompt from within a Microsoft Windows operating system (such as Win 95/98). While it appears that any program operating from the DOS prompt is a computer within the Windows 95/98 computer, it is actually a WIN 95/98 operating system program giving that appearance.

A second, well known emulation program is the original Microsoft Windows program named "Windows for Work Groups". As installed on the old Intel-286 computers, this program gave the appearance and feel of Windows, but it was actually a DOS program. It wasn't until Windows 95 was introduced by Microsoft that a true Windows operating system was available to Microsoft software users.

Emulation technology has little substantive benefit in digital evidence examinations. However, it is an important concept in understanding the evolution of computer processing from single dedicated machines to virtual processing.

### **Generation Five**

The fifth and most recent generation of digital evidence forensic technology involves virtual processing wherein a computer actually operates within a computer (that is, not a simulation, but rather in reality). Virtual processing provides the examiner with a choice of utilizing traditional static data recovery techniques while running either the operating system (to view the desktop) or select application programs (to view proprietary binary data and understand the significance of specialized application programs). Virtual processing only involves manipulation of the image file in the computer memory, thereby eliminating the problem of changing file date/time stamp information or temporary work areas associated with the operating system.

Continued technology advances (such as virtual image processing) are an efficient means to examine data both statically and dynamically, without having to produce two evidentiary work copies. Thus, the technique reduces the need for an additional examiner computer or the concurrent additional examiner time needed to make the second copy. This saves both resources and time, two precious commodities in most digital evidence laboratories.

Questions or comments?  
E-mail: [mphelan-at-erols.com](mailto:mphelan-at-erols.com)

# Microgram

## *Bulletin*

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**VOL. XXXVII, NO. 7**

**JULY 2004**

**- INTELLIGENCE ALERT -**

**5-METHOXY-*ALPHA*-METHYLTRYPTAMINE (5-MeO-AMT) IN  
COMMERCIAL BREATH FRESHENING DROPPER BOTTLES IN HOKE COUNTY,  
NORTH CAROLINA AND ONTARIO, OREGON**

The North Carolina State Bureau of Investigation's Drug Laboratory (Raleigh, North Carolina) recently received a submission of four small squeeze bottles of commercial peppermint-flavored breath freshening drops, suspected to contain LSD (see Photo 1). The bottles were seized by the Hoke County Sheriff's Office during a traffic stop in Hoke County, North Carolina (located in the southeastern part of the state). Each bottle was one-half to three-quarters full of a slightly yellowish liquid (net total volume approximately 394 drops) with an odor of peppermint. The suspect stated that the bottles contained LSD, and the liquid in fact field-tested positive for LSD. Analysis by GC/MS, however, indicated not LSD but rather 5-methoxy-*alpha*-methyltryptamine

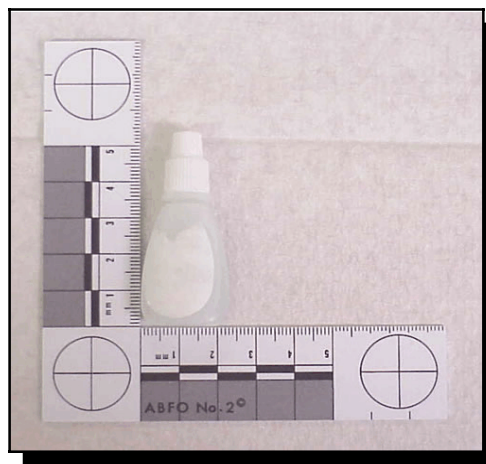


**Photo 1**

(5-MeO-AMT) in all four bottles (not quantitated). The analysis also identified menthol, suggesting that the drug was added to the breath freshening solution (not that a solution of the drug was substituted for the breath freshening solution). The laboratory has previously encountered commercial breath freshening dropper bottles containing solutions of LSD; however, this was the first submission of 5-MeO-AMT in liquid form to the laboratory.

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The Oregon State Police Forensic Services Division Laboratory (Ontario, Oregon) recently received a single squeeze bottle of a commercial, spearmint-flavored breath freshening solution, suspected to contain a controlled substance (identity unknown). The exhibit was seized by the Ontario City Police at an express mail facility. The bottle (label partially removed; see Photo 2) contained a clear liquid (total net volume approximately 3.5 milliliters) with a slight odor of spearmint. Analysis by GC/MS indicated 5-methoxy-*alpha*-methyltryptamine (5-MeO-AMT), probably dissolved in water (not quantitated). The only slight odor of spearmint suggested that the original breath freshening solution had been removed and replaced with the solution of 5-MeO-AMT. The suspect in the case is suspected to have synthesized the drug himself (no further details provided).



**Photo 2**

Within a week of the submission of the above exhibit to the Ontario Laboratory, the Oregon State Police Forensic Services Division Laboratory (Springfield, Oregon) received a submission of two capsules containing an off-white powder (total net mass 0.2 grams) and a paperfold of an off-white powder (total net mass 0.1 grams), all suspected methamphetamine (photos not available). The exhibits were seized by the Lincoln City Police Department, pursuant to a shoplifting arrest (Lincoln City is located on the Pacific coast, about 50 miles west of Salem). The suspect in the case claimed that the material was Vitamin B (field testing was not performed). Analysis by GC/MS, however, indicated not methamphetamine but rather 5-methoxy-*alpha*-methyltryptamine (5-MeO-AMT) (not quantitated).

\* \* \* \* \*

### **- INTELLIGENCE ALERT -**

#### **BULK MARIJUANA IN COMPUTER CASES IN PEORIA, ARIZONA**

The Arizona Department of Public Safety Central Regional Crime Laboratory (Phoenix, Arizona) recently received two “tower”-style computer cases containing five bundles of plant material (see Photo 3, next page), plus eight additional bundles of similarly packaged plant material removed from two other computer cases (not submitted), all suspected marijuana. The exhibits (total gross mass 50.06 kilograms) were seized by the Peoria Police Department



**Photo 3**



**Photo 4**

(circumstances of seizure not reported; Peoria is a suburb of Phoenix). Each bundle was wrapped with layers of plastic wrap and mustard, then duct-taped. With the exception of the power supplies, the two submitted computer cases had been emptied to provide space for the bundles (see Photo 4). In addition, the vent areas of the cases were blocked (on the inside) with pieces of styrofoam and metal foil. The computer cases were each packaged inside a plastic bag with formed styrofoam packing pieces, which were inside separate factory-labeled cardboard boxes. Finally, both boxes were packed into a single larger shipping box. It is assumed that the non-submitted computer towers were packaged in a similar manner. Analysis of the plant material by microscopic examination and the Duquenois-Levine color test confirmed marijuana. Although the laboratory frequently encounters these types of bundles, this was the first submission of marijuana bundles packed inside computer cases.

\* \* \* \* \*

### **- INTELLIGENCE ALERT -**

### **SOY-BASED LECITHIN TABLETS (CONTAINING A HEROIN/COCAINE MIXTURE) IN LONG ISLAND, NEW YORK**

The Forensic Evidence Bureau of the Nassau County Police Department (Long Island, New York) recently received three brown plastic bottles containing a total of 425 brownish/tan tablets, suspected heroin (see Photo 5). The bottles had been mailed to a local residence from Bogota, Colombia and were seized by the Nassau County Police Department. Each bottle was labelled in Spanish as containing soy-based lecithin tablets (a phosphorus-containing “neutraceutical”), with additional information indicating the contents were a natural vitamin



**Photo 5**



supplement. Each tablet was convex on one side, flat on the opposite side, 0.5 inch in diameter, and weighed an average of 1.142 grams (total net mass of all tablets 485.4 grams) (see Photo 6). Analysis by color testing, TLC, and GC/MS, however, indicated not just heroin but rather a mixture of heroin and cocaine (not quantitated, but in an approximate 60:35 ratio based on the Total Ion Chromatogram). Small amounts of acetylcodeine, monoacetylmorphine, and papaverine were also identified. This is the first ever submission of a heroin/cocaine mixture in tablet form to the laboratory (in fact, the laboratory has never previously encountered either heroin or cocaine in tablet form).



**Photo 6**

\* \* \* \* \*

### **- INTELLIGENCE ALERT -**

### **POWDERED COCAINE HYDROCHLORIDE IN CANS AND LIQUOR BOTTLES FROM EL SALVADOR**

The DEA Mid-Atlantic Laboratory (Largo, Maryland) recently received four 30 ounce aluminum cans commercially labelled as “Corazón de Palmito” / “Heart of Palm” each containing tightly packed bundles of white powder (see Photo 7), and two brown glass 750 mL liquor bottles, one commercially labelled as containing rum and the other missing its label, each containing aluminum foil wrapped white powder (Photo 8), all suspected cocaine.



**Photo 7**

The exhibits originated in El Salvador, and were seized by Immigration and Customs Enforcement agents at Dulles International Airport (Dulles, Virginia). Analysis of the powder (total net mass 2,925 grams) by FT-IR, GC, and GC/MS confirmed 78 percent and 52 percent cocaine hydrochloride, respectively (cuts not identified). The information on the labelled bottle indicated that the rum was a product of Guatemala. The laboratory has previously received liquor bottles used for smuggling controlled substances, but not in this particular manner.



**Photo 8**



**- INTELLIGENCE ALERT -**

**LARGE SEIZURE OF EPHEDRINE AND PSEUDOEPHEDRINE  
IN BLAINE, WASHINGTON**

The DEA Western Laboratory (San Francisco, California) recently received an unusual submission consisting of two unlabelled, medium-sized, blue plastic barrels, each containing double-bagged plastic bags of white crystalline powder, suspected pharmaceutical grade pseudoephedrine (see Photo 9). The barrels (dimensions approximately 23 inches high and 46.5 inches in circumference around the center (widest) section) originated in Canada and were intercepted by Immigration and Customs Enforcement agents at the Blaine, Washington POE. Analysis of the powder (total net weights of 25.13 and 24.91 kilograms, respectively) by FTIR, GC/FID, and HPLC confirmed 100 percent



**Photo 9**

*d*-pseudoephedrine hydrochloride in the first barrel, but 100 percent *l*-ephedrine hydrochloride in the second barrel. This is the largest such submission of bulk pharmaceutical ephedrine or pseudoephedrine to the laboratory in over five years.

\* \* \* \* \*

**- INTELLIGENCE ALERT -**

**MDMA LABORATORY SEIZED IN NASHVILLE**

[From the NDIC *Narcotics Digest Weekly* 2004;3(23):2  
Unclassified, Reprinted with Permission.]

On May 8, 2004, officials from DEA, Tennessee Bureau of Investigation (TBI), Nashville Metropolitan Police Department, and the Murfreesboro Police Department seized a fully operational MDMA laboratory in Nashville. On May 7, 2004, the Murfreesboro Police Department responded to a medical call regarding an unconscious male at a local hotel. When officers arrived at the hotel, they found the man conscious and in possession of one capsule of a white powdery substance subsequently determined to be MDMA. The man informed officers that he had obtained the capsule from another man staying at the hotel who was in possession of additional capsules. Officers proceeded to the man's room and found it occupied by a male and a female. The officers requested and obtained consent to search the room, where they discovered 65 capsules containing MDMA. The male occupant of the room informed officers that he had obtained the MDMA from a source in Nashville and had subsequently placed an order for an additional 100 capsules to be delivered to the hotel. The source was arrested when he arrived at

the hotel to deliver the drugs. Officers interviewed the source, who informed them that he had been manufacturing MDMA in his apartment in Nashville since September 2003. Officers from the Murfreesboro Police Department, along with officers from DEA, TBI, and the Nashville Metropolitan Police Department, obtained and executed a search warrant at the man's apartment on May 8, 2004. They discovered various chemicals used in the production of MDMA including sassafras oil, benzoquinone, hydrogen chloride, palladium chloride, and nitromethane as well as empty capsules, laboratory equipment, and buckets of chemical waste. The man was arrested and charged federally with possession of MDMA with intent to distribute, distribution of MDMA, and possession of chemicals and equipment with reasonable cause to believe they will be used in the manufacture of a controlled substance.

*NDIC Comment:* Most of the MDMA available in the United States is produced in clandestine laboratories in the Netherlands and Belgium. Domestic production remains limited, as evidenced by few MDMA laboratory seizures. According to the DEA El Paso Intelligence Center (EPIC) National Clandestine Laboratory Seizure System (NCLSS), law enforcement agencies reported only three domestic MDMA laboratory seizures in 2003 - one each in Florida, Louisiana, and Texas. As of May 28, 2004, law enforcement officials reported six domestic MDMA laboratory seizures - one each in California, Florida, North Carolina, Pennsylvania, South Dakota, and Tennessee.

[Editor's Note: The presence of *para*-benzoquinone and palladium chloride at the laboratory indicated that the operator was using the Wacker oxidation technique for production of MDP2P. The Wacker technique is now in use all across the U.S.]

\* \* \* \* \*

### **- INTELLIGENCE ALERT -**

#### **FIRST METHAMPHETAMINE LABORATORY SEIZED IN VERMONT**

[From the NDIC *Narcotics Digest Weekly* 2004;3(25):3  
Unclassified, Reprinted with Permission.]

On June 1, 2004, troopers from the Vermont State Police Drug Task Force seized an operational methamphetamine laboratory from a rental home located in a rural area near Shrewsbury and arrested two men on felony charges of manufacturing a regulated drug. According to investigators, the men - Arkansas residents who were working construction jobs in Missouri - traveled to Vermont in the week prior to their arrests to meet with a Vermont resident who had worked with them in Missouri. On their way to Vermont, the defendants allegedly obtained quantities of ephedrine and other supplies commonly used to manufacture methamphetamine. After arriving in Vermont, they and other associates including their former coworker and his girlfriend traveled to numerous local retail stores to purchase additional quantities of over-the-counter products such as bottles of pseudoephedrine, boxes of matches, and other items used to manufacture methamphetamine. After acquiring the necessary components and chemicals, the defendants set up a laboratory at the residence of their former coworker and his girlfriend and produced at least three batches of methamphetamine prior to their arrest.

*NDIC Comment:* Most methamphetamine production occurs in the Pacific, Southwest, and West Central regions of the country. Limited but increasing methamphetamine production occurs in the Northeast/Mid-Atlantic region. According to the DEA El Paso Intelligence Center (EPIC) National Clandestine Laboratory Seizure System (NCLSS), authorities report that 140 methamphetamine laboratories were seized in the Northeast/Mid-Atlantic region in 2003, an increase from 94 in 2002. According to officials from the Vermont State Police, this is the first methamphetamine laboratory seized in the state.

\* \* \* \* \*

## **- INTELLIGENCE BRIEF -**

### **NATIONAL DRUG THREAT ASSESSMENT 2004 SPOTLIGHT: MDMA**

[From the NDIC *Narcotics Digest Weekly* 2004;3(25):4  
Unclassified, Reprinted with Permission.]

According to the National Drug Threat Assessment 2004 released by NDIC in April 2004, the trafficking and abuse of MDMA (3,4-methylenedioxymethamphetamine) pose a moderate threat to the United States. Law enforcement reporting indicates that MDMA (also known as ecstasy) is readily available in all regions of the country, particularly in metropolitan areas, and that availability is stable overall. National Drug Threat Survey 2003 data reveal that 54.1 percent of state and local law enforcement agencies nationwide describe MDMA availability as high or moderate. Regionally, a greater proportion of agencies in the Northeast/Mid-Atlantic and Southeast regions report high or moderate availability than those in the Pacific, Southwest, Great Lakes, and West Central regions. The overall demand for MDMA in the United States is high, although national-level prevalence data indicate that MDMA use is trending downward, particularly among adolescents.

Most of the MDMA available in the United States is produced in clandestine laboratories located in the Netherlands and Belgium and, to a much lesser extent, in other foreign countries such as Canada and Mexico. Domestic MDMA production remains limited, as evidenced by few domestic MDMA laboratory seizures. MDMA is transported from Europe to the United States by couriers on commercial flights, via mail and package delivery services and, to a lesser extent, by air cargo and maritime vessels. MDMA is distributed in all regions of the United States, and law enforcement reporting indicates that distribution of the drug appears to be relatively stable to slightly increasing. Israeli and Russian criminal groups control most wholesale MDMA distribution in the United States; however, Asian, Colombian, Dominican, Middle Eastern, and traditional organized crime groups also distribute wholesale quantities of MDMA. Caucasian males aged 18 to 30 control most retail distribution of MDMA that generally occurs where teens and young adults congregate. The primary market areas for MDMA are Los Angeles, Miami, and New York.

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**- INTELLIGENCE ALERT -**

**SUSPECTED PSILOCYBIN MUSHROOM CULTIVATION OPERATION SEIZED  
[IN ESPANOLA, NEW MEXICO]**

[From the NDIC *Narcotics Digest Weekly* 2004;3(26):2  
Unclassified, Reprinted with Permission.]

On May 17, 2004, New Mexico State Police narcotics agents seized a suspected psilocybin mushroom cultivation operation located in an Espanola residence. The mushroom grow operation was uncovered during the execution of a search warrant issued in connection with the investigation of a suspected cocaine distributor. A male occupant of the residence, who was the target of the cocaine investigation, was arrested on an outstanding warrant for methamphetamine production in Farmington and subsequently admitted to operating the mushroom grow site. The grow was located in a bedroom within the residence. Mushroom cultures were placed in glass jars containing rice and placed in three separate refrigerators in the bedroom. The refrigerators were covered with a plastic tent and equipped with a humidifier to aid growth. Over 500 jars of cultures and mushrooms were seized.

*NDIC Comment:* Psilocybin mushrooms contain psilocybin, a Schedule I controlled substance that may induce hallucinations. Psilocybin mushrooms often are available at raves, dance clubs, and college campuses and are most commonly abused by teenagers and young adults. While seizures of personal use amounts (usually one-quarter-ounce quantities) of psilocybin mushrooms are common in northern New Mexico, a seizure of this magnitude is extremely rare and represents the first large-scale production site seized in the area. Additionally, this case demonstrates a trend toward polydrug distribution. The defendant, whose illegal activities allegedly included cocaine distribution, methamphetamine production, and mushroom cultivation, is one of an increasing number of drug traffickers who distribute more than one drug.

\* \* \* \* \*

**- INTELLIGENCE BRIEF -**

**LICIT POPPY CULTIVATION IN INDIA**

During a recent training assignment in India, two DEA Forensic Chemists received a rare opportunity to visit the Government of India's legally grown opium poppy fields. India is the world's largest legal producer of opium. The legal opium poppy fields are distributed in the northern states of Uttar Pradesh, Rajasthan, and Madhya Pradesh. The two chemists visited some of the fields in the Neemuch District in Madhya Pradesh. The farmers who cultivate legal opium poppies hold licenses from the Government of India. Fields are assigned to each farmer, and typically measure anywhere between 0.1 and 0.4 hectares. The Government of India predicts (and expects) an opium yield of 54 kilograms per hectare for opium fields in the Neemuch District for the 2004 harvest. This is based on research on the variety of opium poppy under cultivation, and consideration of the agronomical and climatic conditions. Similar calculations are performed for opium production in other growing regions. Farmers who do not

meet the minimum yield (for whatever reason) can lose their licenses at the end of the season. At the time of the visit, the poppy fields were being harvested. Therefore, very few poppy flowers were observed. According to the farmers, white flowers are common in the District, along with some red or pink flowers. Poppy seeds can be purchased from the local markets for cultivation. Several types of lancing and collection tools were displayed for the visiting chemists. The collection of opium using one of the specialized tools was also demonstrated for their benefit (see Photo 10). There is no mechanized harvesting employed in these fields. During their tour, the chemists observed workers lancing the capsules in a local poppy field (see Photo 11).

Once the farmers begin the harvest, collection camps are established throughout the region where Chemists and law enforcement officials from the Narcotic Control Bureau (NCB) screen the incoming opium for quality, and ensure its safe transportation to a nearby Government of India Laboratory of Opium and Alkaloid Works. Farmers are paid about 90 percent of their income at the collection camps, providing they produce the proper quantity of high-grade, unadulterated opium.

According to a representative of the Government Laboratory of Opium and Alkaloid Works, adulteration is “common”. However, if the chemists at the collection camps suspect adulteration, the farmers will not be paid until their product is analyzed at the laboratory. Once the opium is transported to the laboratory and analyzed for quality assurance, it is combined based on its moisture content, then dried to approximately 10 percent moisture content for export. This is done both by sun drying and by using mechanical drying methods. The export quality opium is a dry solid. Following the drying process, it is packaged in paper, then wrapped in plastic for export. The majority of the product is shipped to foreign pharmaceutical companies for alkaloid extraction.



**Photo 10**



**Photo 11**

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## CORRECTIONS, CLARIFICATIONS, AND UPDATES

### ADDITIONAL INFORMATION ON THE MDMA LABORATORY IN MARION, SOUTH DAKOTA

[Editor's Preface: The June issue of *Microgram Bulletin* included an Intelligence Alert (reprinted from the NDIC's *Narcotics Digest Weekly*) that reported the seizure of an MDMA/polydrug laboratory in Marion, South Dakota (the NDIC summary indicated that a marijuana grow operation was also found, along with psilocybe mushrooms. Note that Marion is located about 30 miles west-southwest of Sioux Falls. Forensic chemists from the DEA North Central Laboratory (Chicago, Illinois) responded to this laboratory. Analysis of the chemicals on site indicated that the laboratory operator had also synthesized 4-bromo-2,5-dimethoxyphenethylamine (2C-B). The laboratory's report follows.]



Photo 12

Twenty-six exhibits were seized at the site and submitted to the North Central Laboratory for evaluation. Analysis by color tests, GC/MS, FTIR, GC/FID, and NMR confirmed both MDMA and 4-bromo-2,5-dimethoxyphenethylamine (2C-B), as well as numerous precursors and reaction intermediates for MDMA and 2C-B, including safrole, isosafrole, 3,4-methylenedioxyphenylacetone (MDP2P), 2,5-dimethoxybenzaldehyde, and 2,5-dimethoxy-*beta*-nitrostyrene. In addition, 228.9 grams of 3,4,5-trimethoxybenzaldehyde and 11.4 grams of 3,4,5-trimethoxy-*beta*-nitrostyrene were identified, which suggested that the synthesis of mescaline was also being attempted. One of the MDMA exhibits (total net mass 38.0 grams of white, crystalline powder) was quantitated at 99+ percent. This powder was located on a plate near the glassware set-up in the laboratory (see Photo 12). The defendant claimed to have finished an MDMA synthesis 4 - 5 hours prior to the raid. The 2C-B (total net mass 5.1 grams) was not quantitated, but appeared to also be of high purity. The three safrole exhibits were quantitated at 95 percent (two exhibits of a yellowish-brown liquid) and 100 percent (one exhibit of a clear, colorless liquid), for a net total of over 500 milliliters of actual safrole. The marijuana grow had plants as tall as 3 feet (see Photo 13; total net mass approximately 550 grams). The total net mass of psilocybe mushrooms was approximately 300 grams (photo not provided). The MDMA was synthesized via the Wacker oxidation route, while the 2C-B and mescaline were being synthesized via the respective nitrostyrene intermediates. This is believed to be the first ever 2C-B laboratory seized by the North Central Laboratory.



Photo 13



## SELECTED REFERENCES

[Notes: Selected references are a compilation of recent publications of presumed interest to forensic chemists. Unless otherwise stated, all listed citations are published in English. If available, the email address for the primary author is provided as the contact information. Listed mailing address information (which is sometimes cryptic or incomplete) exactly duplicates that provided by the abstracting services. In addition, in order to prevent automated theft of email addresses off the Internet postings of *Microgram Bulletin*, unless otherwise requested by the corresponding author, all email addresses reported in the *Bulletin* have had the “@” character replaced by “-at-”; this will need to be converted back (by hand) before the address can be used.]

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2. Fenton JJ. **Forensic toxicology.** Forensic Science 2003;45. [Editor's Notes: Presents a review of the title topic (discussion includes (unspecified) drugs of abuse). This is a CRC Press publication. Contact: Crozer-Keystone Health Systems and West Chester University, Media, PA (zip code not provided in the abstract).]
3. Sherma J. **High-performance liquid chromatography/mass spectrometry analysis of botanical medicines and dietary supplements: A review.** J Assoc Off Anal Chem 2003;86(5):873. [Editor's Notes: Presents the title topic, with additional discussion of related techniques. Contact: Lafayette College, Department of Chemistry, Easton, PA 18042.]
4. Jacob P, Haller CA, Duan MJ, Yu L, Peng M, Benowitz NL. **Determination of ephedra alkaloid and caffeine concentrations in dietary supplements and biological fluids.** Journal of Analytical Toxicology 2004;28(3):152. [Editor's Notes: No abstract provided. Contact: P Jacob, Univ Calif San Francisco, Div Clin Pharmacol, San Francisco, CA 94110.]
5. Wickens J. **The chemistry of fingerprints.** Chemistry Review 2003;13(1):6. [Editor's Notes: A review of the title topic. Contact: Department of Chemistry, University of York, UK.]

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## NEW EMAIL ADDRESSES NEEDED

The email addresses for the following organizations have returned rejection notices to the *Microgram* Editor for the past three issues of *Microgram Bulletin*, and will therefore be dropped from the subscription list unless a corrected email address is provided by the end of July 2004. Note that the errors include anti-spamming, mailbox full, user not found, or user unknown messages. The Editor requests your assistance in contacting these organizations, determining if they wish to remain on the *Microgram* subscription e-net, and if so asking them to provide a valid email address to the Editor at: [microgram\\_editor -at- mailsnare.net](mailto:microgram_editor-at-mailsnare.net)

Baltimore County Police Department Forensic Laboratory, Towson, Maryland

Michigan State Police, Bridgeport Forensic Science Laboratory, Bridgeport, Michigan

Mississippi Crime Laboratory, Jackson, Mississippi

Multi Area Narcotics Task Force, Defiance, Ohio

Nara Prefectural Police Headquarters, Forensic Science Laboratory, Nara, Japan

Orangeburg Department of Public Safety, Orangeburg, South Carolina

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**The following organizations (listed in the June issue) were dropped on 7/31/04:**

Delaware Office of the Chief Medical Examiner, Wilmington, Delaware

Mississippi Crime Laboratory / Gulf Coast Branch, Biloxi, Mississippi

Tripura State Forensic Science Laboratory, West Tripura, India

USAF / AFOSI DET 303, Travis AFB, California

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## THE JOURNAL/TEXTBOOK COLLECTION EXCHANGE

There were no offerings of journals or textbooks made over the past quarter.

**Subscribers are encouraged to donate surplus or unwanted items or collections; if interested, please consult the *Microgram* website for further instructions.**

The next offering of journals and textbooks will be in the October 2004 issue of *Microgram Bulletin*.

\* \* \* \* \*

## THE DEA FY - 2004 STATE AND LOCAL FORENSIC CHEMISTS SEMINAR SCHEDULE

The remaining FY - 2004 schedule for the DEA's State and Local Forensic Chemists Seminar is as follows:

September 20 - 24, 2004

Note that the school is open only to forensic chemists working for law enforcement agencies, and is intended for chemists who have completed their agency's internal training program and have also been working on the bench for at least one year. There is no tuition charge for this course. The course is held at the AmeriSuites Hotel in Sterling, Virginia (near the Washington/Dulles International Airport). A copy of the application form is appended onto the October 2003 issue of *Microgram Bulletin*, and should be mailed to the Special Testing and Research Laboratory (Attention: Pam Smith or Jennifer Kerlavage) at: 22624 Dulles Summit Court, Dulles, VA 20166. For additional information, call 703 668-3337.

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### SCIENTIFIC MEETINGS

**1. Title: 14<sup>th</sup> Annual CLIC Training Seminar**

(Third Posting)

**Sponsoring Organization:** Clandestine Laboratory Investigating Chemists Association

**Inclusive Dates:** September 8 - 11, 2004

**Location:** Portland Marriott Downtown; Portland, OR

**Contact Information:** Pam Smith, 703/668-3337, [auk.ling-at-verizon.net](mailto:auk.ling-at-verizon.net) and Roger Ely, 415/744-7051, [rogely-at-atdial.net](mailto:rogely-at-atdial.net)

**Website:** [None]

\* \* \* \* \*

**2. Title: SWAFS Fall Conference**

(Third Bimonthly Posting)

**Sponsoring Organization:** Southwestern Association of Forensic Scientists

**Inclusive Dates:** October 11 - 15, 2004

**Location:** Oklahoma City, OK

**Contact Information:** Brandy Reese, 405/425-3857, [brandyr-at-osbi.state.ok.us](mailto:brandyr-at-osbi.state.ok.us)

**Website:** [\[www.swafs.us\]](http://www.swafs.us)

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**3. Title: Joint Meeting of the Southern Association of Forensic Scientists, the Midwestern Association of Forensic Scientists, the Mid-Atlantic Association of Forensic Scientists, and the Canadian Society of Forensic Science**

(Third Bimonthly Posting)

**Sponsoring Organization:** Southern Association of Forensic Scientists

**Inclusive Dates:** September 19 - 24, 2004

**Location:** Lake Buena Vista, FL

**Contact Information:** David Baer, 407/650-5152, [davidb7818-at-aol.com](mailto:davidb7818-at-aol.com); Mike Healy 941/747-3011, Ext. 2280, [mike.healy-at-co.manatee.fl.us](mailto:mike.healy-at-co.manatee.fl.us)

**Website:** [\[www.southernforensic.org\]](http://www.southernforensic.org)

\* \* \* \* \*

# Computer Corner

## Deleterious Change - Concerns and Potential Responses

# #184

by Michael J. Phelan  
DEA Digital Evidence  
Laboratory

The proper handling and documentation of evidence has always been a critical best practice for all forensic subdisciplines, including digital evidence. However, even though digital evidence is a relatively new and somewhat unusual endeavor relative to traditional forensic disciplines, most laboratory or agency evidence policies and procedures can be easily adapted to accommodate its “everyday” requirements. After all, “evidence is evidence”.

There are, however, some unique aspects of digital evidence which merit management attention, especially those that have the potential to effect deleterious change(s). In this context, deleterious changes are those which modify or destroy the evidence. Proactive actions on the part of laboratory managers in the areas of digital evidence supply kit procurement, investigator awareness training, and written evidence handling procedures can help preclude such problems.

It is important to maintain perspective in any discussions concerning digital evidence handling. Policies and procedures must address basic core concerns such as evidence paperwork documentation, accuracy of evidence

descriptions, evidence labeling, evidence seals, chain-of-custody record keeping, evidence access control, and evidence storage. Evidence handling is not, however, a new concept to any law enforcement organization, and so the focus should be on adaptation of existing agency policies and procedures to the digital evidence program. There is no need to start from “ground zero”.

### Environmental Issues

The environmental concerns with digital evidence are few, but do merit special consideration. Certain potentially harmful conditions must be avoided. First, some digital evidence can be lost or modified by magnetic fields. Second, heat, extreme cold, high humidity, and water can affect both hardware and data contained within the hardware. Third, static discharge can be a big problem - particularly on carpeted floors in low humidity environments. Fourth, some biohazard sanitizing scanner technology (such as “e-beam” radiation used to sanitize mail (to destroy Anthrax)) can cause damage by melting some forms of plastic based storage media.

### Evidence Packaging and Sealing

Another area of concern is the proper packaging of digital evidence. Most digital evidence

objects do not fit into standard agency evidence envelopes. The use of tape to seal a computer case is impractical, because of the number of access gateways (CD/DVD drive, floppy drive, Zip drive, parallel port, USB port, Firewire port, PCMCIA slot, removable hard drive bays, etc.). It is therefore more practical to package and seal the entire case in a box or a large plastic bag. The use of large anti-static bags is preferred, but they are not yet commonly available. The DEA Digital Evidence Laboratory recently purchased a large lot of such bags with labels at a cost of \$1.00 apiece.

In addition, computer evidence should be protected from rough handling, using packing material to offset excessive vibrations and impacts. This is particularly important when mailing evidence. While the external (metal) case itself does a reasonable job of protecting the internal components of a computer, the CPU should still be packaged to avoid damage (for example, to prevent the unseating of internal circuit boards and wire connectors).

The seizure and submission of a removed hard drive creates new challenges. In such instances, use of protective cardboard or plastic shipping cases, such as those already used in retail sales

of new or replacement hard drives, is very desirable. However, these carrying cases are not readily available.

Similarly, external storage media such as diskettes, CDs, DVDs, Zip cartridges, data tapes, and thumb drives require some protection for shipping. Even just the normal sliding around in a loosely packed sealed box or evidence bag can result in damage during transport. Floppy diskettes, tape cartridges, and Zip drive media access shields and cases can bend, crush, or crack. CDs and DVDs can be scratched. Such damage can result in the partial or complete loss of the evidence.

### **Need for Training**

The solution to these problems is threefold. First, investigators in the field need training on how to handle, label, and package digital evidence – especially those items with which they are unfamiliar. Digital evidence laboratories need to reach out to the investigators that it serves, and provide some basic “Do’s and Don’t’s”. The recommended handling procedures for all major types of digital evidence should be provided. This can easily be accomplished by providing a simple instruction sheet during training.

### **Evidence Collection Kit**

Second, digital evidence laboratories should provide digital evidence seizure kits to its field offices and crime scene teams. At a minimum, the seizure kit should consist of: 1) Large anti-static bags capable of securing a full tower computer;

2) Small anti-static padded bags for securing external storage media such as diskettes or tapes; 3) Paper sleeves for securing loose CDs or DVDs; 4) Large labels for identifying or differentiating evidence exhibits; 5) Plastic or card board hard drive transport boxes; 6) Plastic or metal ties to seal large bags containing digital evidence; 7) Tamper resistant evidence tape (such as saw tooth tape); 8) General evidence bags; and 9) Standard agency evidence seals. Unfortunately, there are currently no commercial sources for such kits – so a laboratory will most likely have to contract out for them, or purchase and assemble the components locally and distribute them as needed.

Finally, a ready supply of anti-vibration packaging material (e.g., Styrofoam popcorn or foam packaging) is needed for shipping evidence.

### **Policy and Procedure Review and Modification**

Third, agency policies and procedures should be reviewed to determine their ability and adequacy to accommodate digital evidence. For example, an area that may need revision is in-process storage (that is, because the digital evidence object may be too large to fit into a standard lock box). Similarly, digital evidence lock boxes should be lined internally with bubble wrap to ameliorate potentially harmful jarring when moving a lock box between the laboratory and storage vault. Another issue that may need modification is the breaking of evidence seals on battery powered, embedded digital

evidence objects (e.g., cell phones, two way pagers, and personal digital assistants (Palm and Blackberry computers)), in order to be able to plug the item into a charger or replace its batteries. [All battery powered evidence should be checked to determine if its batteries need replacement or charging - failure to do so can result in the loss of the data.]

### **Be Proactive**

A proactive approach to digital evidence handling can prevent loss of evidence. Improved handling will also enhance the chain-of-custody. Digital evidence laboratory managers should evaluate if everything that can reasonably be done, is being done. After all, “evidence is evidence”.

Questions or comments?

E-mail: [mphelan-at-erols.com](mailto:mphelan-at-erols.com)





# Microgram

## *Bulletin*

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**VOL. XXXVII, NO. 8**

**AUGUST 2004**

**- INTELLIGENCE ALERT -**

**DILTIAZEM, HYDROXYZINE, AND METHYLEPHEDRINE IDENTIFIED  
IN SEPARATE SHIPMENTS OF COCAINE**

The Cocaine Signature Program at the DEA Special Testing and Research Laboratory (Dulles, Virginia) has recently received cocaine from large shipments that contained several highly unusual adulterants. In the first example, the U.S. Coast Guard made two separate seizures from vessels in the Caribbean Sea (totalling 2223 kilograms) of cocaine HCl containing various amounts of diltiazem hydrochloride. Diltiazem hydrochloride is a white to off-white powder with a bitter taste and a molecular weight of 450.99 amu. It is legitimately used to treat angina, hypertension, and irregular heartbeats, and is the active ingredient in heart medications produced by a myriad of pharmaceutical companies. It appears that the diltiazem hydrochloride was added to the cocaine at the final processing stage of converting cocaine base to cocaine HCl (that is, just before being formed into kilogram bricks). Signature analyses indicate that the cocaine in this case originated from Colombian grown coca leaf and was converted to cocaine HCl utilizing Colombian Method solvents (that is, most likely in Colombia). The bricks contained from 71 - 85 percent cocaine HCl and 8 - 20 percent diltiazem hydrochloride.

In the second example, a number of multi-kilogram seizures were made at or near the Texas/Mexico border (net totals not reported) of cocaine HCl containing various amounts of

hydroxyzine dihydrochloride. Hydroxyzine has a molecular weight of 374.9 amu and is classified as an antihistamine. It is legitimately used to treat anxiety, motion sickness, and skin rashes. It again appears that the hydroxyzine was added to the cocaine at the final processing stage of converting cocaine base to cocaine HCl. Signature analyses indicate that the cocaine in this case originated from Colombian grown coca leaf and was converted to cocaine HCl utilizing Colombian Method solvents (again, most likely in Colombia). The bricks contained 75 - 84 percent cocaine HCl and 3 - 10 percent hydroxyzine dihydrochloride (other cocaine related alkaloids constituted as much as 14 percent of these exhibits).

In the third example, a number of multi-kilogram seizures were made by the U.S. Coast Guard and the Drug Enforcement Administration of cocaine HCl seizures containing various amounts of methylephedrine. One seizure (2200 kilograms) was made in the Caribbean Sea, while a second (amount not reported) was made off the coast of Florida, and a third (amount not reported) was made near Calexico, California. Methylephedrine has a molecular weight of 179.3 amu. It is legitimately used for its moderate CNS stimulant effects, and is often found in diet pills. Although not controlled, it is closely monitored as a List I chemical due to its occasional use in illicit methamphetamine production (that is, to produce dimethylamphetamine). It again appears that the methylephedrine was added to the cocaine at the final processing stage of converting cocaine base to cocaine HCl. Signature analyses indicate that the cocaine in this case originated from Colombian grown coca leaf and was converted to cocaine HCl utilizing Colombian Method solvents (again, most likely in Colombia). The bricks contained 71 - 78 percent cocaine HCl and 10 - 19 percent methylephedrine.

[Editor's Notes: Since these original reports, three additional seizures of cocaine containing diltiazem (25, 24, and 855 kilograms, respectively) and one additional seizure of cocaine containing methylephedrine (72 kilograms) were analyzed at the laboratory. However, no further seizures of cocaine containing hydroxyzine were submitted to the laboratory.]

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### **- INTELLIGENCE ALERT -**

#### **PSILOCYBIN MUSHROOM/CHOCOLATE CONCOCTION IN LIVE OAK, FLORIDA**

The Florida Department of Law Enforcement Tallahassee Crime Laboratory (Tallahassee, Florida) recently received a roughly cube-shaped piece of apparent chocolate wrapped in aluminum foil, submitted as an unknown/ possible drug substance (see Photo 1). The exhibit was seized by the Live Oak Police Department at the Suwannee Spring Fest in Live Oak, Florida (about 80 miles east of Tallahassee). Due to the recent, large number of reports of psilocybin mushroom/chocolate



**Photo 1**

concoctions, it was suspected by laboratory analysts that this was a similar type exhibit (even though it did not appear to have been formed in any type of mold). Analysis of the material (total net mass 11.5 grams) using the previously published rapid extraction method by Sarwar and McDonald (*Microgram Journal* 2003;1(3-4):177) and GC and GC/MS confirmed psilocin (quantitation not performed). This was the first submission of a psilocybin mushroom/chocolate concoction to the Laboratory.

\* \* \* \* \*

## **- INTELLIGENCE ALERT -**

### **HEROIN IN SIMULATED RED BEANS AT JFK AIRPORT**

The DEA Northeast Laboratory (New York, New York) recently received a bag of red beans, some genuine and some false, with the false beans containing a brown powder, suspected heroin (see Photos 2 and 3). The relative percentages of genuine versus false beans was not determined. The bag (see Photo 4) originated in Ecuador, and was submitted by the Homeland Security (Immigration and Customs Enforcement) JFK Airport Office, after being seized from the unclaimed shipments warehouse at JFK Airport. Analysis of the powder from the fake beans (total net mass 480.5 grams) by GC/FID, GC/MS and FTIR confirmed 68 percent heroin hydrochloride. The Northeast Laboratory has previously encountered similar false beans as a heroin concealment technique, on several occasions.



**Photo 2 - Fake versus Real Bean**



**Photo 3**  
**Mixed Fake and Real Beans**



**Photo 4**



**- INTELLIGENCE ALERT -**

**LEATHER "PICTURES" FROM EL SALVADOR CONTAINING COCAINE  
AT DULLES AIRPORT, VIRGINIA**

The DEA Mid-Atlantic Laboratory (Largo, Maryland) recently received four leather pictures in wooden frames that contained packages of white powder in the frames, suspected cocaine (see Photo 5). The exhibits were seized by Customs and Border Protection Officers at the Dulles International Airport (Virginia) from a passenger on a flight originating in El Salvador. The frames (approximate dimensions 18 x 18 x 2 inches) were taped together as



**Photo 5**

pairs; each had a leather picture glued across the back of frame (picture facing forward). The pictures were: A) A head, two birds, and the title "El Salvador"; B) A head, a pyramid, and the title "El Salvador"; C) A seashore and the word "Ilopango"; and D) [Scene could not be identified]. The powder was packaged in plastic bags that were further wrapped in foil and hidden inside hollowed-out cavities in the frames. Each frame contained 18 plastic bags for a total of 72 plastic bags, total net mass of powder 1995 grams. Analysis by GC/FID, GC/MS and FTIR- ATR confirmed 79 percent cocaine hydrochloride. This is the second recent exhibit the Mid-Atlantic Laboratory has received of cocaine hidden inside picture frames.

\* \* \* \* \*

**- INTELLIGENCE ALERT -**

**VERY LARGE SEIZURE OF COCAINE  
BASE MADE OFF THE WEST COAST  
OF SOUTH AMERICA**

The DEA Southwest Laboratory (Vista, California) recently received an unusual exhibit consisting of 1832 individual packages of a variety of dimensions and weights, containing an off-white waxy material (total net mass approximately 3500 kilograms), suspected cocaine (see Photo 6). The exhibit was seized by the U.S. Coast Guard from a vessel in international waters off the western coast of South America. The packages were in three general shapes:



**Photo 6**

Single bricks approximately 7 x 3.5 x 1.5 inches; double bricks approximately 9 x 3 x 3 inches; and rounded cubes approximately 7.5 x 7.5 x 5 inches. The non-standard shapes of the packages and the physical consistency of the substance suggested that the material was not cocaine hydrochloride. This was confirmed when there was essentially no response with the non-acidified cobalt thiocyanate reagent, but a very strong positive was observed with the acidified cobalt thiocyanate reagent. Analysis by IR and GC indicated 86 percent cocaine base. Unusually, the exhibit did not contain sodium bicarbonate or any other material commonly used to convert cocaine hydrochloride to cocaine base. This is the largest seizure of cocaine base ever received by the Southwest Laboratory.

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### **- INTELLIGENCE ALERT -**

#### **COCAINE IN CARVED WOODEN WALL HANGINGS AT THE MIAMI INTERNATIONAL MAIL FACILITY**

The DEA South Central Laboratory (Dallas, Texas) recently received a submission of six carved wooden wall hangings containing tape-wrapped bundles of white powder, suspected cocaine (see Photo 7). The carvings (total net mass 14.14 kilograms) were seized by Immigration and Customs Enforcement officers at the International Mail Facility in Miami, Florida, and were submitted to the laboratory after a controlled delivery in Ft. Worth, Texas. The origin of the carvings was not reported to the laboratory. Each of the six carvings was of a unique design; however, all six were approximately the same size (dimensions not measured exactly, but the ruler in Photo 7 is six inches long). All six of the carvings had an internal cavity that contained the bundles (see Photo 8). Analysis by FTIR, GC/FID, GC/MS, and HPLC of the powder (total net mass 2.930 kilograms) confirmed 74 percent cocaine hydrochloride, cut with phenacetin, caffeine, aminopyrine, and dimethylterephthalate. It is believed that this was the first submission of this type to the laboratory.



**Photo 7**



**Photo 8**

**- INTELLIGENCE ALERT -**

**INK CARTRIDGES FROM VENEZUELA CONTAINING HEROIN  
IN MEMPHIS, TENNESSEE**

The DEA Northeast Laboratory (New York, New York) recently received ten ink cartridges containing a tan colored powder (total net mass 398.6 grams), suspected heroin (see Photo 9). The exhibits originated in Venezuela, and were submitted by the Homeland Security (Immigration and Customs Enforcement) New York City Office, after being seized at the Federal Express Hub in



**Photo 9**

Memphis, Tennessee. Analysis by GC/FID, GC/MS and FTIR confirmed 82 percent heroin hydrochloride. The Northeast Laboratory routinely receives heroin smuggled in different consumer and manufacturing items, but this was the first time that ink cartridges were submitted as a concealment technique.

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**- INTELLIGENCE ALERT -**

**BICYCLE FRAME PART FROM PERU CONTAINING HEROIN IN CAROLINA,  
PUERTO RICO**

The DEA Southeast Laboratory/San Juan Satellite Laboratory (San Juan, Puerto Rico) recently received a bicycle frame part containing an off-white powder (total net mass 951.1 grams), suspected heroin (see Photo 10). The exhibit was seized by Customs and Border Protection officers in Carolina, Puerto Rico (a suburb of San Juan) from an express mail package arriving from Peru. Analysis by GC/FID, GC/MS, and FTIR-ATR confirmed 58 percent heroin hydrochloride. This was the first submission of this type to the laboratory.



**Photo 10**



**- INTELLIGENCE ALERT -**

**ASIA-PRODUCED PSEUDOEPHEDRINE INCREASINGLY USED IN SUPERLABS**

[From the NDIC *Narcotics Digest Weekly* 2004;3(28):2  
Unclassified, Reprinted with Permission.]

In May 2004, law enforcement officials from the Los Angeles County Regional Information Clearinghouse reported that pseudoephedrine products produced in Asia increasingly are being encountered at methamphetamine laboratories throughout cities on the West Coast. One such product, a cold medicine produced in Taiwan, has been discovered at methamphetamine laboratories in California, Oregon, and Washington. For instance, while investigating a methamphetamine laboratory in Stanislaus County in February 2004, agents with the Stanislaus Drug Enforcement Agency discovered three large trash bags full of empty bottles for this cold medicine, each with 1,000-tablet capacity. Additionally, pseudoephedrine products manufactured in Hong Kong have been seized in California. Asia-produced pseudoephedrine products primarily are transported to the United States in containerized cargo through the Port of Long Beach. Asian pseudoephedrine products also are transported to Mexico for use in methamphetamine production in that country or for smuggling overland into the United States.

NDIC Comment: Asia-produced pseudoephedrine products have been seized primarily at large methamphetamine laboratories, including superlabs (laboratories capable of producing 10 or more pounds of methamphetamine in a single production cycle). Superlab operators typically purchase bulk quantities of Canada-produced pseudoephedrine products from groups that smuggle the product across the U.S.-Canada border. However, successful law enforcement activities over the past few years have restricted the availability of bulk quantities of pseudoephedrine products from Canada and may be forcing superlab operators to obtain bulk quantities of pseudoephedrine from other sources, including those in Asia.

\* \* \* \* \*

**- INTELLIGENCE ALERT -**

**ANHYDROUS AMMONIA TANKS STOLEN FROM FISHING VESSELS**

[From the NDIC *Narcotics Digest Weekly* 2004;3(30):2  
Unclassified, Reprinted with Permission.]

On June 3, 2004, officials from the Seattle Police Department, Seattle Harbor Patrol, and Milton Police Department announced the arrests of six individuals for their alleged participation in a criminal group that stole tanks of anhydrous ammonia from fishing vessels and subsequently sold them to methamphetamine producers. The defendants are charged with theft of anhydrous ammonia and several other offenses including burglary, theft of a motor vehicle, and trafficking in stolen property. From November 2003 through March 2004, the defendants allegedly stole approximately twelve 300-pound containers of anhydrous ammonia from fishing vessels anchored in Lake Union. The defendants allegedly stole small watercraft, including inflatable

boats and rowboats docked on Lake Union, to travel to fishing vessels anchored away from shore that contained the anhydrous ammonia tanks. Once on board the fishing vessels, the defendants removed the anhydrous ammonia tanks and lowered them into the water, generally attaching them to the outside of the stolen watercraft. The defendants arranged the tanks so that they would float just below the water's surface to avoid detection. The defendants transported the tanks to shore and loaded them into a waiting vehicle. The tanks were subsequently sold to methamphetamine producers, primarily in Pierce County, for \$1,400 to \$1,500 per tank.

NDIC Comment: Anhydrous ammonia is a colorless, pungent gas legitimately used as a fertilizer and as a refrigerant in commercial air-conditioning systems. It is also used as a refrigerant aboard fishing vessels, the largest of which can carry thousands of pounds of the chemical. Anhydrous ammonia is used illicitly by methamphetamine laboratory operators to produce methamphetamine using the Birch reduction method. The chemical frequently is stolen from storage facilities situated on farmlands, from retail facilities selling agricultural supplies and, increasingly, from fishing vessels. In Washington, anhydrous ammonia is commonly diverted, particularly in the western part of the state. According to the NDIC National Drug Threat Survey 2003, 80.9 percent of state and local law enforcement respondents in Washington report that anhydrous ammonia is commonly diverted for use in illicit drug production in their jurisdictions.

\* \* \* \* \*

## **- INTELLIGENCE BRIEF -**

### **KHAT IN NORTHBROOK, ILLINOIS**

The Northern Illinois Police Crime Laboratory (Highland Park, Illinois) recently received a submission of three bundles of green plant material (total net mass 96.60 grams), each wrapped in what appeared to be a banana leaf, suspected khat (see Photo 11). The exhibit was taken from a much larger (approximately 30 pounds) seizure made by the Northbrook Police Department at the Northbrook UPS Office. Unusually, the material had been shipped in just a box (not a cooler, as is more typically encountered), and so was already beginning to deteriorate when received by the laboratory (where it was stored in a freezer upon receipt). Despite the decomposition, however, analysis by GC/MS indicated both cathinone and cathine, confirming that the plant material was khat. This was the first submission of khat to the laboratory.



**Photo 11**

**- INTELLIGENCE BRIEF -**

**THREE TYPES OF ECSTASY MIMIC TABLETS CONTAINING COCAINE,  
METHAMPHETAMINE, AND MDA IN FLORIDA**

The Florida Department of Law Enforcement Orlando Regional Crime Laboratory (Orlando, Florida) recently received three different sets of tablets, suspected MDMA. The first exhibit was submitted by the Orange County Sheriff's Office, and consisted of 18 round pink tablets with a thin white coating on one side and a thin pink coating on the opposite side, total net mass 6.1 grams (see Photo 12). The white face had a dollar sign (\$) logo, while the pink face was unmarked. Marquis color tests of each layer gave no reactions; however, the acidified cobalt thiocyanate test gave a blue color for the pink layer and a very pale blue color for the white layer. Analysis by GC and GC/MS indicated not MDMA but rather a mixture of cocaine and pseudoephedrine.



**Photo 12**

The second exhibit consisted of 2 large (about 2 centimeters in diameter), round, green tablets with a "777" logo (see Photo 13). Analysis by GC and GC/MS indicated not MDMA but rather a mixture of methamphetamine and 3,4-methylenedioxymphetamine (MDA).



**Photo 13**

The third exhibit was submitted by the Apopka Police Department, and consisted of 10 unusually thick (about 8 x 8 millimeters), poorly pressed, crumbly round tablets (some in pieces) that were an unusual "sandwich" type design, with a thick green middle section and a white layer on each side, total net mass 4.8 grams (see Photo 14). Both white faces had a six-point star logo. Again, the Marquis color test gave no reaction while the acidified cobalt thiocyanate test gave a blue color. Analysis by GC and GC/MS indicated not MDMA but rather a mixture of cocaine, caffeine, and aspirin.



**Photo 14**

The first two exhibits are the first ever submissions of cocaine-containing tablets to the laboratory; however, the laboratory

has previously received several submissions of combination methamphetamine/MDA tablets (though not with "777" logos).

\* \* \* \* \*

**- INTELLIGENCE BRIEF -**

**BUPRENORPHINE TABLETS NEAR SEATTLE, WASHINGTON**

The Naval Criminal Investigative Service Regional Forensic Laboratory (San Diego, California) recently received a submission of numerous suspected drug items from a military agency near Seattle, Washington. Included among the various exhibits were two intact orange colored hexagonal tablets along with broken tablets pieces and orange powder, total net mass 2.15 grams (see Photo 15). The approximate tablet weight and dimensions were 0.4 grams/tablet, 10.5 millimeters between parallel sides, and slightly biconvex, 3.3 millimeters at the edge and 4.6 millimeters at the center. The two intact tablets had an "N8" logo on one face, and were single scored on the reverse face. Because of their poor quality, these tablets were suspected to be of clandestine manufacture. However, they were subsequently identified as the commercial product, "Suboxone", that contain 8 milligrams of buprenorphine (a Schedule III semi-synthetic opiate derived from thebaine) and 2 milligrams of naloxone hydrochloride per tablet. Analysis of a methanol extract by GC/MS identified buprenorphine, naloxone, and mannitol (quantitation not performed). This is the first time that buprenorphine has been submitted in any form to the laboratory.



**Photo 15**

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**- INTELLIGENCE BRIEF -**

**MDMA LABORATORY SEIZED IN AMHERST [NEW YORK]**

[From the NDIC *Narcotics Digest Weekly* 2004;3(28):2  
Unclassified, Reprinted with Permission.]

On June 14, 2004, DEA agents seized an operational MDMA (3,4-methylenedioxymethamphetamine, also known as ecstasy) laboratory in Amherst and arrested its suspected operator. The

defendant was charged with possession with intent to manufacture, distribute, or dispense a controlled substance and importing into the United States a controlled substance or List I chemical. DEA agents uncovered the laboratory after learning in April 2004 that an individual with a Buffalo post office box had ordered 5 kilograms of sassafras oil from France. Agents made a controlled delivery to the post office box and arrested the defendant when he claimed the parcel. Following the defendant's arrest, agents executed a search warrant at his Amherst residence and found glassware and precursor chemicals used to make MDMA. Additionally, agents found \$2,400 and approximately 1 kilogram of marijuana. Agents also executed a search warrant at a nearby rental storage facility used by the defendant, where they discovered 5 pounds of suspected MDMA as well as other chemicals. Because of the dangerous nature of the seized chemicals, members of a clandestine laboratory team from New York City responded to help clean up the laboratory. Investigators from ICE, New York State Police, Erie County Sheriff's Office, Niagara County Sheriff's Office, Niagara County Drug Task Force, and Amherst Police Department also participated in the investigation.

NDIC Comment: Domestically produced MDMA is rare both in New York State and the rest of the country; this was the first MDMA laboratory seizure in New York reported to the National Clandestine Laboratory Seizure System. Most of the MDMA available in New York is smuggled from Europe to New York City by couriers on commercial aircraft and then transported throughout the state. Some MDMA also is smuggled from Europe to Toronto before it is transported into Buffalo via private vehicles.

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#### **- INTELLIGENCE BRIEF -**

#### **TRAFFIC STOP RESULTS IN LARGE CODEINE SEIZURE**

[From the NDIC *Narcotics Digest Weekly* 2004;3(28):3  
Unclassified, Reprinted with Permission.]

On May 26, 2004, a Utah Highway Patrol (UHP) trooper arrested a 26-year-old male and a 27-year-old male and seized 13 gallons of promethazine cough syrup with codeine during a routine traffic stop on Interstate 70. The trooper initially stopped the vehicle for speeding. During routine questioning, the driver advised the trooper that he and his passenger were returning to Kentucky after a visit to Las Vegas. The trooper obtained and ran a check on the driver's Kentucky license. The trooper discovered that the driver's license had been suspended, and took the driver into custody. The trooper then called for backup and requested and received consent to search the vehicle. Another trooper arrived and both troopers searched the vehicle. The troopers discovered a snow cone making machine and 13 snow cone syrup containers in the trunk. The troopers became suspicious after noticing that 10 of the syrup containers had been opened and resealed. The passenger indicated that he had purchased the snow cone maker and syrup in California. The driver and the passenger were detained while a sample of the liquid was taken to a laboratory for immediate testing. When test results identified the substance as codeine, both were arrested and charged with possession of a controlled substance.

NDIC Comment: This was the third UHP seizure of codeine being transported from California to Kentucky since January 2003. Law enforcement officials in Kentucky report that the diversion of pharmaceuticals including codeine is an increasing threat. According to National Drug Threat Survey 2003 data, 51.5 percent of state and local law enforcement respondents in Kentucky report that codeine is commonly diverted and illicitly used in the state.

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**- INTELLIGENCE BRIEF -**

**EFFECTS OF OKLAHOMA PSEUDOEPHEDRINE LAW REALIZED IMMEDIATELY**

[From the NDIC *Narcotics Digest Weekly* 2004;3(28):3  
Unclassified, Reprinted with Permission.]

The Oklahoma Bureau of Narcotics and Dangerous Drugs Control (OBNDDC) reports that the enactment of a law prohibiting over-the-counter sales of tablets containing pseudoephedrine, a precursor chemical used in the production of methamphetamine, has had an immediate effect on the number of methamphetamine laboratory seizures in the state. According to OBNDDC, the number of methamphetamine laboratory seizures in the state decreased from 90 in March 2004--the month before the law took effect--to 64 in April, to 29 in May. Additionally, law enforcement officials in other states report that methamphetamine producers from Oklahoma are traveling to neighboring states with less stringent pseudoephedrine control laws to obtain pseudoephedrine. For example, the Wichita Falls (TX) Police Department reports a sharp increase in the number of Oklahomans who travel to its jurisdiction near the Oklahoma border to purchase pseudoephedrine tablets.

NDIC Comment: Methamphetamine poses the greatest drug threat to Oklahoma, and in recent years the number of methamphetamine laboratories seized in the state has increased dramatically. According to OBNDDC, the number of methamphetamine laboratory seizures increased from 34 in 1995, to 924 in 2000, to 1,193 in 2001 before leveling off at 1,254 and 1,235 in 2002 and 2003, respectively. The level of violence associated with the production, distribution, and abuse of methamphetamine also has increased. Since 1999, three Oklahoma Highway Patrol troopers have been killed in methamphetamine-related incidents, the latest of which occurred in December 2003, when a trooper was murdered while attempting to arrest the alleged operator of a mobile methamphetamine laboratory.

\* \* \* \* \*      \* \* \* \* \*      \* \* \* \* \*      \* \* \* \* \*      \* \* \* \* \*



## DEA OFFICE OF DIVERSION REQUEST FOR INFORMATION

### TRYPTAMINES AND PHENETHYLAMINES

Recently there has been an increase in law enforcement encounters with a variety of unusual tryptamines and phenethylamines. These substances are not specifically scheduled within the federal Controlled Substances Act (CSA).

The tryptamines include:

- N,N-Dipropyltryptamine (DPT)
- N,N-Diisopropyltryptamine (DIPT)
- 5-Methoxy-N,N-diethyltryptamine (5-MeO-DET)
- 5-Methoxy-N,N-dimethyltryptamine (5-MeO-DMT)
- 5-Methoxy-alpha-methyltryptamine (5-MeO-AMT)
- 4-Methoxy-N-methyl-N-isopropyltryptamine (4-MeO-MIPT)
- 5-Methoxy-N-methyl-N-isopropyltryptamine (5-MeO-MIPT)
- N-Methyl-N-isopropyltryptamine (MIPT)
- 4-Hydroxy-N,N-diisopropyltryptamine (4-OH-DIPT)

The phenethylamines include:

- 2,5-Dimethoxy-4-ethylthiophenethylamine (2C-T-2)
- 4-Iodo-2,5-dimethoxy-phenethylamine (2C-I)
- 2,5-Dimethoxy-4(2-fluoroethylthio)phenethylamine (2C-T-21)
- 2,5-Dimethoxy-4-ethylphenethylamine (2C-E)
- 2,5-Dimethoxy-4-chlorophenethylamine (2C-C)
- 5-(2-Aminopropyl)indane (API)
- 5-Chloro-3,4-dimethoxyphenethylamine

The Drug and Chemical Evaluation Section (ODE) within the DEA's Office of Diversion Control is interested in documenting the abuse, diversion, trafficking, and public health risks of the above listed tryptamines and phenethylamines, as well as any other related substances. This information is being collected to document the need for possible placement (scheduling) of these substances under the CSA. Federal, state and local law enforcement agencies and forensic laboratories often provide valuable information for this purpose. ODE would appreciate receiving any information related to the law enforcement encounters, drug identification and abuse of the above mentioned tryptamines and phenethylamines, as well as any related substances. Please contact Dr. Srihari R. Tella, Pharmacologist in ODE, at (202) 307-7183 with any information pertaining to these substances. Information may also be provided to Dr. Tella by fax at (202) 353-1263, or by email to [Srihari.R.Tella-usdoj.gov](mailto:Srihari.R.Tella-usdoj.gov) or by mail addressed to the Drug and Chemical Evaluation Section, Office of Diversion Control, Drug Enforcement Administration, Washington, DC 20537.

\* \* \* \* \*

## SELECTED REFERENCES

[Notes: Selected references are a compilation of recent publications of presumed interest to forensic chemists. Unless otherwise stated, all listed citations are published in English. If available, the email address for the primary author is provided as the contact information. Listed mailing address information (which is sometimes cryptic or incomplete) exactly duplicates that provided by the abstracting services. In addition, in order to prevent automated theft of email addresses off the Internet postings of *Microgram Bulletin*, unless otherwise requested by the corresponding author, all email addresses reported in the *Bulletin* have had the “@” character replaced by “-at-”; this will need to be converted back (by hand) before the address can be used.]

1. Bogusz MJ. **Analysis of illicit drugs with chromatographic methods.** Separation Techniques in Clinical Chemistry 2003;221. [Editor's Notes: An extensive review on the title topic. Contact: Department of Pathology and Laboratory Medicine, King Faisal Specialist Hospital and Research Centre, Riyadh, Saudi Arabia.]
2. Garrido JMPJ, Delerue-Matos C, Borges F, Macedo TRA, Oliveira-Brett AM. **Electrochemical analysis of opiates - An overview.** Analytical Letters 2004;37(5):831. [Editor's Notes: An overview and review of the title topic, with an emphasis on morphine, codeine, and heroin. Contact: Univ Coimbra, Fac Ciencias & Tecnol, Dept Quim, P-3004535 Coimbra, Portugal.]
3. Kawase K, Ogawa Y, Watanabe Y. **Non-destructive terahertz imaging of illicit drugs using spectral fingerprints.** Optics Express 2003;11(20):2549. [Editor's Notes: The title technique is used to detect methamphetamine and MDMA inside envelopes. Contact: The Institute of Physical and Chemical Research, Hirosawa, Wako, Japan 351-0198.]
4. Littleford RE, Matousek P, Towrie M, Parker AW, Dent G, Lacey RJ, Smith WE. **Raman spectroscopy of street samples of cocaine obtained using Kerr gated fluorescence rejection.** Analyst 2004;129(6):505. [Editor's Notes: Presents the title study. Contact: Univ Strathclyde, Dept Pure & Appl Chem, 295 Cathedral St., Glasgow G1 1XL, Lanark, Scotland.]
5. Raevskii VG, Karev AI, Konyaev YA, Rumyantsev AS, Brazers L. **Method and device for detection and identification of concealed explosives and narcotics.** RU 2226686 C1 10 Apr 2004. CLASS: ICM: G01N023-00. APPLICATION: RU 2002-121666 14 Aug 2002. [Editor's Notes: Methodology is not clear from the abstract. The narcotics are not specified. This patent is written in Russian. Contact: Fizicheskii Institut im. P.N. Lebedeva RAN, Russia.]

### Additional References of Possible Interest:

1. Multiple Authors. **Analytical Chemistry Fundamental Reviews 2004.** Analytical Chemistry 2004;76(12):3251 et seq. [Editor's Notes: Presents overviews and reviews of the following topics: Planar Chromatography, Solid State Nuclear Magnetic Resonance, Fiber-Optic Chemical Sensors and Biosensors, Electrochemical Sensors, Thermal Analysis, Atomic Spectroscopy, Environmental Mass Spectrometry (Emerging Contaminants and Current Issues), Chemometrics, Micro Total Analysis Systems (Recent Developments), Gas Chromatography, Inductively Coupled Plasma Mass Spectrometry, Mass Spectrometry of Synthetic Polymers, Scanning Probe Microscopy, and X-ray Spectrometry. See the issue for authors and contact information.]

2. Biermann T, Schwarze B, Zedler B, Betz P. **On-site testing of illicit drugs: The use of the drug-testing device "Toxiquick"**. Forensic Science International 2004;143(1):21. [Editor's Notes: Presents a study of the use of the title device on suspected impaired drivers in Germany. Contact: Department of Forensic Medicine, University Erlangen-Nuremberg, Universitaetsstrasse 22, Erlangen D-91054, Germany.]
  
3. Bogusz MJ. **Liquid chromatographic/mass spectrometry in forensic toxicology**. Advances in Forensic Applications of Mass Spectrometry 2004:63. [Editor's Notes: An extensive review of the title topic, focussing on toxicological applications. Contact: Department of Pathology and Laboratory Medicine, King Faisal Specialist Hospital and Research Centre, Riyadh, Saudi Arabia.]
  
4. Dimandja J-MD. **GC x GC**. Analytical Chemistry 2004;76(9):167A. [Editor's Notes: An overview and review of two-dimensional GC techniques. Contact: Spelman College (no further addressing information provided).]
  
5. Kapnissi CP, Warner IM. **Separation of benzodiazepines using capillary electrochromatography**. Journal of Chromatographic Science 2004;42(5):238. [Editor's Notes: Abstract suggests a biological focus. Contact: Louisiana State Univ, Dept Chem, Baton Rouge, LA 70803.]
  
6. Levisky JA, Bowerman DL, Jenkins WW, Boon JA, Levisky JS, Johnson DG. **The use of two different isotopic drug analogs as internal standards in the GC/MS quantitation of opiates in postmortem specimens: Demonstration of linearity with a single injection**. Meeting of the International Association of Forensic Sciences, 16th, Montpellier, France, Sept. 2-7, 2002:105. [Editor's Notes: Presents a novel and advantageous approach to the stable isotope dilution technique. Oxycodone, morphine, and hydrocodone were analyzed with the presented technique. Contact: El Paso County Coroner's Office, Colorado Springs, CO (zip code not provided in the abstract).]
  
7. Rabarjo TJ, Widjaja I, Roytrakul S, Verpoorte R. **Comparative proteomics of Cannabis sativa plant tissues**. Journal of Biomolecular Techniques 2004;15(2):97. [Editor's Notes: Presents the title study. Contact: verpoort -at- lacdr.leidenuniv.nl ]
  
8. Ramon MF, Ballesteros S, Martinez-Arrieta R, Jorrecilla JM, Cabrera J. **Volatile substance and other drug abuse inhalation in Spain**. Journal of Toxicology, Clinical Toxicology 2003;41(7):931. [Editor's Notes: An overview and review of inhalant abuse in Spain, 1991 - 2000. Contact: Servicio de Informacion Toxicologica, Instituto Nacional de Toxicologia, Madrid, Spain.]
  
9. Schmid R. **Drug analysis - Potentials and limits**. Opiatabhaengigkeit 2003:193. [Editor's Notes: A review on drug analysis; appears to be primarily focused on biological matrices (unclear from the abstract). This article is written in German. Contact: Klinisches Institut fuer Krankenhaus Wien, A-1090 Vienna, Austria.]
  
10. Ueki M. **Fundamentals of mass spectrometry; Role of mass spectrometry in drug abuse testing and crime investigation**. Bunseki 2003(11):630. [Editor's Notes: A minor review of the title topic. May be a biological focus (not clear in the abstract). This article is written in Japanese. Contact: Dep. of BCL Doping Test, Mitsubishi Chemical Corp., Itabashi-ku, Tokyo, Japan 174-8555.]

11. Xie S, Aspromonte J, Balla A, Sershen H, Javitt DC, Cooper TB. **Sensitive and simple gas chromatographic - mass spectrometric determination for amphetamine in microdialysate and ultrafiltrate samples.** Journal of Chromatography B - Analytical Technologies in the Biomedical and Life Sciences 2004;805(1):27. [Editor's Notes: Uses NCI mode for detection of the pentafluorobenzoyl derivatives (biological focus). Contact: Inst Psychiat Res, Analyt Psychopharmacol Lab, 140 Old Orangeburg Rd, Orangeburg, NY 10962.]

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## NEW EMAIL ADDRESSES NEEDED

The email addresses for the following organizations have returned rejection notices to the *Microgram* Editor for the past three issues of *Microgram Bulletin*, and will therefore be dropped from the subscription list unless a corrected email address is provided by December 1, 2004. Note that the errors include anti-spamming, mailbox full, user not found, or user unknown messages. The Editor requests your assistance in contacting these organizations, determining if they wish to remain on the *Microgram* subscription e-net, and if so asking them to provide a valid email address to the Editor at: [microgram\\_editor -at- mailsnare.net](mailto:microgram_editor-at-mailsnare.net)

Bexar County Medical Examiner's Office, San Antonio, Texas

Carabinieri Investigazioni Scientifiche Raggruppam, 00165 Rome, Italy

Louisiana State Police, North Delta Criminalistics Laboratory, West Monroe, Louisiana

New Hampshire Department of Corrections, Drug Testing Laboratory, Laconia, New Hampshire

Racine Health Department, Racine, Wisconsin

Washington State Department of Health, Olympia, Washington

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**The following organizations (listed in the July issue) were dropped on 11/1/04:**

Mississippi Crime Laboratory, Jackson, Mississippi

Multi Area Narcotics Task Force, Defiance, Ohio

Nara Prefectural Police Headquarters, Forensic Science Laboratory, Nara, Japan

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## THE DEA FY - 2004 STATE AND LOCAL FORENSIC CHEMISTS SEMINAR SCHEDULE

The FY - 2005 schedule for the DEA's State and Local Forensic Chemists Seminar is as follows:

December 6 - 10, 2004  
February 7 - 11, 2005  
May 9 - 13, 2005  
July 11 - 15, 2005  
September 19 - 23, 2005

Note that the school is open only to forensic chemists working for law enforcement agencies, and is intended for chemists who have completed their agency's internal training program and have also been working on the bench for at least one year. There is no tuition charge for this course. The course is held at the AmeriSuites Hotel in Sterling, Virginia (near the Washington/Dulles International Airport). A copy of the application form is reproduced on the last page of this issue of *Microgram Bulletin*, and may be photocopied. Completed applications should be mailed to the Special Testing and Research Laboratory (Attention: Pam Smith or Jennifer Kerlavage) at: 22624 Dulles Summit Court, Dulles, VA 20166. For additional information, call 703/668-3337.

\* \* \* \* \*

## SCIENTIFIC MEETINGS

### 1. Title: AAFS 57th Annual Meeting

(First Posting)

**Sponsoring Organization:** American Academy of Forensic Sciences

**Inclusive Dates:** February 21 - 26, 2005

**Location:** New Orleans, LA

**Contact Information:** See Website

**Website:** [www.aafs.org](http://www.aafs.org)

\* \* \* \* \*

### 2. Title: NOBCChe 32nd Annual Conference

(First Bimonthly Posting)

**Sponsoring Organization:** National Organization for the Professional Advancement of Black Chemists and Chemical Engineers

**Inclusive Dates:** March 20 - 26, 2005

**Location:** J.W. Marriott Grande Lakes, Orlando, Florida

**Contact Information:** b\_couch -at- hotmail.com

**Website:** [www.nobccche.org](http://www.nobccche.org)

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## EMPLOYMENT OPPORTUNITIES

### 1. University of Massachusetts Medical School

(First Posting)

**Position:** Laboratory Analyst II (Two Positions)

**Location:** Worcester, Massachusetts

**Salary Range:** \$32,032 - \$39,915, Commensurate with Experience

**Application Deadline:** Open Until Filled

**Duties:** Performs analytical analysis of evidence for identification and/or quantitation, records information. Performs and documents routine maintenance of equipment. Develops new assays and evaluates new equipment. Trains new personnel.

Provides testimony in court when necessary. Advises and aides DAL Evidence Officer on identification, classification, and handling of evidence.

**Qualifications:** B.S. in Chemistry or equivalent (requires strong emphasis on Chemistry) plus 3 years relevant experience or Master's Degree in Chemistry Forensic Science or equivalent and two years of relevant experience. Strong oral and written communicative skills necessary for interaction with other medical center staff as well as outside agencies.

**Application Procedures:** Apply on-line at: [www.umassmed.edu](http://www.umassmed.edu). Search keyword: 04-1360. Or mail/fax a resume to: University of Massachusetts Medical School, Human Resources, 419 Belmont Street, Worcester MA 01604; fax 508-856-2390.

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## 2. Dupage County Crime Laboratory

(First Posting)

**Position:** Forensic Scientist II (Drug Chemistry)

**Location:** Wheaton, Illinois

**Salary Range:** \$37,700 - \$56,500

**Application Deadline:** Open Until Filled

**Duties:** Under immediate supervision, performs work in the examination, analysis and evaluation of physical evidence and unknown substances. Performs microscopical, chemical, chromatographic, and spectrophotometric analysis of unknown substances. Writes reports detailing the results of analysis and testifies as an expert witness in judicial proceedings. This is not an exhaustive list of responsibilities and other associated tasks may be expected.

**Qualifications:** Must have a bachelor's degree and two years full time drug analysis experience. It is preferred that the applicant has court-testimony experience (been accepted as an expert witness in the drug chemistry discipline). Trainees will not be considered for this position. Hired applicant will be required to successfully complete a competency test prior to assuming independent casework.

**Application Procedures:** If you meet the minimum qualifications and want to be considered for this position, please mail or email a resume or CV to:

Director John Collins  
Crime Laboratory Director  
DuPage County Sheriff's Office Crime Laboratory  
501 N. County Farm Road  
Wheaton, IL 60187  
jcollins -at- dupageco.org

Additional Information: Please contact Supervisor Carina Thomas at (630) 407-2096, or cthomas -at- dupageco.org

Equal Opportunity Employer

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# Computer Corner

## Effectiveness Measures

# #185

by Michael J. Phelan  
DEA Digital Evidence  
Laboratory

The proper management of a digital evidence program requires monitoring a variety of standard performance measures, such as laboratory and individual examiner productivity, unit cost per analysis, and evidence turnaround time. Most digital evidence laboratory managers monitor their operations in these ways.

However, it is even more critical to regularly assess the overall impact of a digital evidence program. Focusing exclusively on resource allocation and/or program execution measurements ignores the two most important questions: (1) Why does an organization have a digital evidence laboratory?; and (2) How effective is that laboratory to the organization's mission?

When considering these two questions, there are clear and significant differences between the private and public sectors. Private industry is ultimately concerned with profit and shareholder wealth. Public Sector organizations, however, are focused on public policy objectives (usually law enforcement and/or intelligence goals).

The private sector usually measures effectiveness as a return on investment. This is typically measured as net profit,

but other factors such as opportunity costs, risk/reward calculations, long term market penetration, and market share are also considered. In most cases, such measures are easily quantifiable.

However, Public Sector program effectiveness measures (ends) are often improperly mingled with or confused with performance measures (management of means), despite rigorous annual budget reviews, innumerable inspection reports, and a mature body of knowledge published by the public administration academia. Qualitative outcomes, not quantitative measures, are the norm.

For example, typical Public Sector digital evidence budget or performance briefings will provide exponential evidence/case submission graphs, incomprehensible "Terabyte Processed" comparison charts, files searched statistics, and similar abstract measurements of examiner or laboratory activities and/or productivity. Presentation of such information is not an effective executive level briefing technique, because it does not address program usefulness or impact.

Every digital evidence program needs to quickly and clearly

address these issues if it is to be successful in acquiring the required budgetary and human resources to fulfill its role. Otherwise, law enforcement executive management will be unable to understand or justify requests for support, or allocate (or redistribute) the required resources.

It is important to recognize that digital evidence examinations in law enforcement are a means to an end. Digital evidence examinations support investigations by recovering information of potential probative value, consistent with forensic best practices. Very rarely is a digital evidence examination the sole investigative activity. It is "just" another forensic investigative tool (albeit a very powerful one) available to the investigator. It logically follows that the proper effectiveness measure(s) for a digital evidence laboratory must assess the impact that the digital evidence examinations have had on case investigations and prosecutions.

DEA has conducted two case agent effectiveness surveys over the last decade. Both of these surveys asked one basic question: "As a result of the digital evidence examination provided in your case, how important was that support to the case's outcome(s)?" The case

agents were given a range of choices as possible responses, including: Not Important, Somewhat Important, Important, and Essential. To further expand on the summary assessments, the case agents were requested to identify the significant outcome(s), again using a range of possible responses, including: Corroboration of prior investigative information, Identification of unknown co-conspirators, Identification of financial assets, Documentation of overt criminal acts, Used in court testimony, Used in plea bargain negotiation(s), Used in sentencing hearing(s), Used in hearing(s) before an administrative law judge, and Used as an intelligence product.

Secondary effectiveness measures may also be included, primarily to identify areas that may need improvement. These can include, for example, questions relating to the timeliness of the examination, thoroughness of the examination, format and usefulness of the final report, and overall performance of the examiner. Such inquiries are good, indirect measures of laboratory support effectiveness.

Although not especially useful for briefings, statistical information can also be useful when evaluating the long-term performance of a digital evidence program. Quantitative measures such as gigabytes or terabytes searched, numbers of e-mails recovered, or numbers of pictures found, are useful statistics for comparing the volume of data from month-to-month or year-to-year.

However, it is important to avoid getting fixated on the numbers. The most important measure of overall effectiveness is always to what degree the digital evidence examination benefited the case or advanced a criminal justice initiative.

Program effectiveness measurements are a critical component in the development of a digital evidence program. Without solid documentation of the unique benefits resulting from the program, digital evidence laboratory managers will not be successful in acquiring required resources. Periodic, formal surveys of customers are highly recommended as a tool to document program effectiveness. Surveys need not be lengthy or overly complex. Use of departmental network based e-mail surveys can be very efficient.

Questions or comments:  
E-mail: Michael.J.Phelan -at- usdoj.gov

## DEA State and Local Forensic Chemists Seminar Application

Name: (PRINT NAME EXACTLY AS IT IS TO APPEAR ON CERTIFICATE)		Title:	
Employer:			
Your Office Mailing Address (include city, state and zipcode)			Length of Service
Business Telephone (     ) -	Business Fax (     ) -	Date of Application	
Email Address			
Education			
University	Degree	Major	
Please Check Which Techniques or Equipment Are Used in Your Lab			
	Color Tests		UV
	Column Chromatography		IR
	Microcrystal tests		CE
	Thin Layer Chromatography		GC/MS
	GC		IR
	HPLC		Other(please specify)
Indicate Analytical Problem(s) Nominee Would Like to Have Covered:			
Choice of Seminar Dates:			
1st Choice:		2nd Choice:	
Laboratory Chief/Director:			
Printed Name : _____		Signature: _____	
Title: _____		Date: _____	
Phone: _____			

# Microgram

## *Bulletin*

**Published by:**

**The Drug Enforcement Administration  
Office of Forensic Sciences  
Washington, DC 20537**

The U.S. Attorney General has determined that the publication of this periodical is necessary in the transaction of the public business required by the Department of Justice. Information, instructions, and disclaimers are published in the January issues.

**VOL. XXXVII, NO. 9**

**SEPTEMBER 2004**

**- INTELLIGENCE ALERT -**

**COCAINE BRICKS SEALED IN A POLYMERIC COATING  
IN A CAR BATTERY IN BROWNSVILLE, TEXAS**

The DEA South Central Laboratory (Dallas, Texas) recently received a submission of six bricks containing a compressed white powder, some with mushy, discolored regions, suspected cocaine. The exhibits had been secreted in the battery of a 2004 Nissan Maxima, and were seized by the U.S. Customs at the Brownsville, Texas Port of Entry. Each brick was about half the size of typical kilogram brick of cocaine, and was imperfectly sealed in a polymeric coating (see Photo 1). The coating was very hard and had to be removed using a hammer and chisel; when broken, it



**Photo 1**

shattered like glass. Underneath the polymeric coating was a rubber-like wrap, followed by black tape, plastic, and finally carbon paper. Some of the bricks had regions that were discolored and mushy, apparently as the result of leakage of battery acid through the various layers. A piece of moistened pH paper confirmed that highly acidic fumes were being emitted by the contaminated regions. Analysis of the powder (total net mass 3,061 grams) by color tests, FTIR, GC/MS, GC/IRD, and HPLC confirmed 84 percent cocaine hydrochloride. It is unknown whether this type of packaging has been previously encountered at the South Central Laboratory.

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### **- INTELLIGENCE ALERT -**

#### **HAMMOCK ROPES CONTAINING HEROIN AT JFK AIRPORT**

The DEA Northeast Laboratory (New York, New York) recently received a set of hammock ropes containing internal plastic sleeves which contained a brown powder, suspected heroin. The ropes (origin not reported) was submitted by the Homeland Security (Immigration and Customs Enforcement) JFK Airport Office, after being seized from the unclaimed shipments warehouse at the airport. The ropes were about ¼ inch in diameter, and consisted of a cloth tube enclosing a plastic sleeve (see Photos 2 - 5). Analysis of the powder (total net mass 577.2 grams) by GC/FID, GC/MS and FTIR confirmed 62 percent heroin hydrochloride. The Northeast Laboratory has previously encountered similar false hammock ropes as a heroin concealment technique.



**Photo 2**



**Photo 3**



**Photo 4**



**Photo 5**



**- INTELLIGENCE ALERT -**

**SUITCASE FRAMES CONTAINING HEROIN FROM AMSTERDAM  
AT THE MINNEAPOLIS/ST. PAUL AIRPORT**

The DEA North Central Laboratory (Chicago, Illinois) recently received two exhibits consisting of black metal and plastic suitcase frame "bars" containing a tan powder, suspected heroin (see Photo 6; note that the apparent white color of the powder in the frame parts is due to the camera flash - the powder is actually tan in color (see the residual powder on the tabletop for the true color). The long black sections are approximately 2 feet in length). The original suitcases (two) were checked luggage on a flight from Amsterdam



**Photo 6**

(The Netherlands) to the Minneapolis/St. Paul Airport, and were seized by U.S. Customs and Border Protection Inspectors at the airport. Some of the powder was held within the bars with tissue and tape plugs, while other bars contained bundles of powder wrapped in tan tape (that is, the tape was wrapped directly around the powder). Analysis of the powder (total net mass 1,535 grams) by FTIR, GC/FID, and GC/MS confirmed 68 percent heroin hydrochloride with small quantities of acetaminophen, caffeine, and chloroquine.

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**- INTELLIGENCE ALERT -**

**"SOUR LIQUID CANDY" DROPPER BOTTLE CONTAINING LSD  
IN WALNUT CREEK, CALIFORNIA**

The Forensic Services Division of the Contra-Costa County Office of the Sheriff-Coroner (Martinez, California) recently received a small dropper bottle commercially labelled as containing a "sour liquid candy" product, suspected to actually be a solution of LSD (photo not available). The exhibit was seized by the Walnut Creek Police Department from an dealer in Walnut Creek (located about 15 miles east-northeast of Oakland). The dropper bottle was approximately 6 x 2 x 1 centimeters in size, and contained 2.4 milliliters of a green colored, flammable liquid that fluoresced under long-wave UV light. Color testing with *para*-dimethylaminobenzaldehyde and GC/MS of a chloroform extract confirmed LSD (not quantitated). The flammable liquid was not identified. This is believed to be the first submission of a liquid LSD solution to the laboratory.

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**- INTELLIGENCE ALERT -**

**HEROIN SATURATED IN CARDBOARD FLOWER BOXES  
IN CLIFTON, NEW JERSEY**

[From the NDIC *Narcotics Digest Weekly* 2004;3(31):2  
Unclassified, Reprinted with Permission.]

On July 13, 2004, officers from the Clifton Police Department arrested two Colombian males and seized 10 kilograms of suspected South American heroin and \$86,000. The officers were on routine patrol when they observed two males acting suspiciously in the rear lot of a video store. When the officers approached the suspects, they observed boxes of flowers and an open compartment in the floor of a hatchback vehicle by which the two men were standing. The officers also observed an opaque plastic bag inside the compartment; however, both suspects denied ownership. The officers requested that a drug-detection canine be brought to the scene. The canine alerted to the bag. The bag contained 2 kilograms of a powdered substance that field-tested positive for heroin. Officers subsequently obtained a search warrant for the residence of one of the suspects, where they discovered an additional 8 kilograms of heroin and \$86,000. During the search, officers obtained evidence to indicate that the suspect arranged to have cardboard boxes containing fresh flowers soaked in a liquid heroin solution shipped from an unidentified source in Ecuador to the John F. Kennedy International Airport in New York. The suspect retrieved the boxes at the airport and took them to his residence, where he extracted the heroin from the boxes. Both suspects were arrested and charged with possession of heroin and possession of heroin with intent to distribute. The suspect who occupied the residence where the search was conducted also was charged with maintaining a narcotics manufacturing facility.

NDIC Comment: Traffickers sometimes saturate clothing or other items with liquid heroin. Heroin is dissolved in a liquid, and clothing or other items are then soaked in the liquid to absorb the heroin. After the clothing or other items dry, they are transported to the United States. Once in the United States, the clothing or other items are again soaked in liquid, and the heroin is extracted from the liquid through a drying process.

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**- INTELLIGENCE ALERT -**

**OVER 22,000 OPIUM POPPY PLANTS SEIZED NEAR PELLA, IOWA**

[From the NDIC *Narcotics Digest Weekly* 2004;3(31):3  
Unclassified, Reprinted with Permission.]

On July 13, 2004, the Marion County Sheriff's Office, Mid-Iowa Narcotics Enforcement Task Force, and Iowa Division of Narcotics Enforcement seized approximately 22,700 opium poppy plants growing in a rural area 2 miles south of Pella. A 70-year-old male as well as 39- and 52-year-old females, all members of a local Hmong family, were arrested and charged with conspiracy to manufacture a Schedule I controlled substance for cultivating the opium. (The

Hmong are a tribe from mountainous regions in Laos.) The opium poppies, growing between rows of vegetables, were 24 to 30 inches high with bulbs ranging from 1½ to 2 inches in diameter. Many of the bulbs had been scored with three to four cuts per bulb to let the opium seep out for subsequent collection. None of the defendants had prior drug arrests; however, they did admit that they knew that growing opium poppies was illegal. They stated that they were growing the opium poppies for medicinal purposes.

NDIC Comment: Opium poppies typically are not grown in the United States. Most opium poppies are cultivated in four foreign source areas--Mexico, South America, Southeast Asia and Southwest Asia. The last significant opium poppy seizure in the United States occurred in June 2003 in the Sierra National Forest in California. This seizure is the first of its kind encountered in the Pella-Marion County area, according to the Marion County Sheriff's Office.

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### **- INTELLIGENCE ALERT -**

#### **COCAINE IN AN AUTOMOBILE BATTERY IN HILL COUNTY, MONTANA**

[From the NDIC *Narcotics Digest Weekly* 2004;3(32):3

Unclassified, Reprinted with Permission;

Some Details Withheld in Accordance with *Microgram* Policy.]

On July 17, 2004, a Montana Highway Patrol (MHP) trooper arrested a 46-year-old male and seized 7.2 pounds of powdered cocaine from a vehicle traveling east on U.S. Highway 2 in Hill County. The trooper initially had stopped the vehicle for speeding. The driver produced a California driver's license and a vehicle registration showing that he owned the vehicle; however, since the driver spoke little English, the trooper requested the assistance of a U.S. Border Patrol (USBP) agent to serve as an interpreter. Through the USBP interpreter, the driver advised that he was traveling from California to Chicago. The driver posted bond at the scene for speeding and was released. However, [due to the use of an unusual procedure to start the vehicle,] the MHP trooper and USBP agents became suspicious and requested and received consent to search the vehicle. The search revealed a false battery with vent caps that were [modified]. A USBP agent [investigated] and recovered a white powder that field-tested positive for cocaine. The Tri-County Drug Task Force was notified and responded to the scene. The vehicle was impounded, and a continued search revealed that the battery case contained 7.2 pounds of cocaine and a small motorcycle battery that allowed the electrical system to function but was not powerful enough to start the vehicle. The suspect was charged with possession of a controlled substance.

NDIC Comment: Law enforcement officials in the Northwest and Midwest increasingly report the use of modified vehicle batteries to conceal illicit drugs. In November 2003 Ada County (ID) Metro Narcotics Unit authorities seized 4 pounds of methamphetamine, 0.25 pound of cocaine, and \$20,000 concealed inside a modified 12-volt automobile battery. In December 2003 Utah Highway Patrol troopers in Beaver County seized 10.5 pounds of methamphetamine, 3 pounds of which were concealed in a modified 12-volt automobile battery.

**- INTELLIGENCE ALERT -**

**19,000 OPIUM POPPY PLANTS SEIZED IN SAN MARTIN, CALIFORNIA**

[From the NDIC *Narcotics Digest Weekly* 2004;3(33):4  
Unclassified, Reprinted with Permission.]

On July 22, 2004 the DEA San Jose Resident Office and the Santa Clara County Sheriff's Office seized and destroyed approximately 19,000 opium poppy plants growing near San Martin. The poppy plants were growing among other flowers on 11 acres close to U.S. Highway 101. A local florist rented the land to grow a variety of flowers, including the poppies, for his business. The florist allegedly did not know that growing opium poppies was illegal, and sold them from his flower shop in bouquets of 7 to 10 flowers. Law enforcement officials found no evidence that the poppies were being grown for illicit purposes, as there were no attempts to conceal the plants as well as no evidence that the plants had been scored. The investigation revealed that other florists in the area - also allegedly unaware that growing opium poppies was illegal - have been growing opium poppies as well. As a result of this incident, a local florists' association was planning to send information to area florists advising them that growing opium poppies is illegal.

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Additional Information: The DEA Western Laboratory (San Francisco, California) assisted law enforcement officers from the DEA San Jose RO, the DEA San Francisco Division, and the Santa Clara County Sheriff's Office, in the seizure of the opium poppy plantation in San Martin, California. The plantation was reported by an individual who had served in the military in Afghanistan, and recognized the plants as being the same type of poppies that he observed during his service there. The plants were found at various stages of development and growing in five separate plots of land, interspersed among other fields of ornamental plants and flowers (see Photo 7). All plants were uprooted and destroyed except for a small sample that was submitted to the laboratory for evidentiary purposes. Analysis by TLC and GC/MS confirmed morphine and codeine (quantitation not reported).



**Photo 7**

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**- INTELLIGENCE ALERT -**

**COCAINE CONCEALED IN BAND EQUIPMENT IN WEST DES MOINES, IOWA**

[From the NDIC *Narcotics Digest Weekly* 2004;3(35):3  
Unclassified, Reprinted with Permission;  
Some Details Withheld in Accordance with *Microgram* Policy.]

On July 27, 2004, the Dallas County Sheriff's Office arrested a 30-year-old male and seized 175 pounds of cocaine from a minivan during a routine traffic stop on Interstate 80 in West Des Moines. Dallas County Sheriff's deputies initially stopped the vehicle because [of a violation]. During routine questioning, the driver indicated that he had rented the vehicle in Las Vegas and was transporting band equipment to Chicago. The minivan contained six large speakers, a drum set, two guitars, and two amplifiers. Officers became suspicious of the driver because [of certain issues with the band equipment]. Officers then called for a drug-detection canine. Officers employed the canine to inspect the exterior of the van with negative results. Officers then requested and received consent to search the vehicle. During their search, officers noticed [some suspect marks on the speakers]. They subsequently removed the speaker fronts and found 55 packages of cocaine totaling 80 kilograms. Twenty-five of the packages weighed 2 kilograms each, and 30 packages weighed 1 kilogram each. The packages were not stamped or marked but were uniquely concealed in several layers of plastic wrap, inner tube material, plastic, latex, additional plastic, electrical tape, fabric softener, and possibly grease. The thoroughness of packaging and concealment by using multiple layers of various materials indicates that the transportation group responsible for the shipment is experienced in drug concealment methods. The driver was arrested and charged with possession with intent to distribute cocaine and violating the Iowa drug tax stamp law.

NDIC Comment: Interstate 80 is part of a primary drug transportation corridor that begins on I-15 in California and connects with I-80 in Salt Lake City. Interstate 80 intersects with I-25 in Des Moines, providing access to Minneapolis-St. Paul, and then continues through Chicago, providing access to Detroit via I-94 and I-75. EPIC Operation Pipeline data from 2002 and 2003 indicate that most cocaine seizures along I-80 in Iowa involved eastbound vehicles en route from southwestern states destined primarily for Chicago or Detroit. According to the Dallas County Sheriff's Office, this is one of the largest cocaine seizures in state history.

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**- INTELLIGENCE BRIEF -**

**VERY LARGE SEIZURE OF VOLKSWAGEN LOGO ECSTASY TABLETS  
IN AMSTERDAM**

The DEA Mid-Atlantic Laboratory (Largo, Maryland) recently received 407,545 green tablets inscribed with a Volkswagen logo on one side and a score mark on the other, suspected MDMA (see Photos 8 and 9, next page). The exhibit was seized in Amsterdam (The Netherlands) from a Venezuelan known to import Ecstasy tablets into the United States through Miami and

Washington, DC. The tablets were round, approximately 7 mm in diameter and 3 mm in thickness, and weighed 131 milligrams each (total net mass approximately 53 kilograms). Color testing by the Marquis gave a black color; and further analysis by FTIR, GC, and GC/MS confirmed 52 milligrams MDMA/tablet. This was one of the largest seizures of MDMA tablets that the Mid-Atlantic Laboratory has ever seen (however, Volkswagen logo tablets have been previously submitted).



**Photo 8**



**Photo 9**

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#### **- INTELLIGENCE BRIEF -**

#### **"BLACK ROCK" (POSSIBLE "LOVE STONE") IN CHEYENNE, WYOMING**

The Wyoming State Crime Laboratory (Cheyenne, Wyoming) recently received a small amount of a dark unknown substance (total net mass 0.37 grams), alleged "Black Rock" from Taiwan (see Photo 10). The material was packaged in a small plastic ear-plug bag, and came with printed instructions for using it as a sexual aid (by topical application to male genitalia). The exhibit was seized by the Cheyenne Police Department from a suspect during a DWUI arrest. In bulk, the sample appeared to be black, but small shards from the bulk sample were amber colored. Analysis by GC/MS (crude solvent extract as well as following derivatization with BSTFA/Trimethylchlorosilane 9:1) indicated a complex mixture containing bufotenine as a minor (and the only controlled) component (quantitation not performed). This was the first submission of "Black Rock" or bufotenine (in any form) to the laboratory.



**Photo 10**

**- INTELLIGENCE BRIEF -**

**ILLICIT DRUGS AND PRECURSOR CHEMICALS SEIZED  
AT BLAINE PORT OF ENTRY**

[From the NDIC *Narcotics Digest Weekly* 2004;3(32):2  
Unclassified, Reprinted with Permission.]

On July 8, 2004, U.S. Customs and Border Protection (CBP) inspectors at the Blaine port of entry (POE) seized approximately 37.8 kilograms of marijuana, 20.6 kilograms of methamphetamine, 253.8 kilograms of ephedrine, 1.14 kilograms of an unidentified substance, and \$3,732, following a Vehicle and Cargo Inspection System (VACIS) scan of an inbound tractor-trailer. The unidentified substance--believed to be either opium or hashish--was sent to a laboratory for further analysis. The contraband was discovered at the Pacific Highway commercial truck crossing inside a tractor-trailer carrying furniture destined for San Francisco. Following a primary inspection, CBP inspectors referred the vehicle for a secondary inspection at the VACIS facility, which revealed an anomaly in the rear portion of the trailer. When the driver opened the trailer doors, the inspectors observed 11 hockey bags and 6 plastic garbage bags. Upon further examination, the inspectors determined that 10 of the hockey bags contained ephedrine and the other hockey bag contained methamphetamine; the garbage bags contained marijuana. The unidentified substance and currency were subsequently discovered during a search of the driver's compartment. The driver, an Iranian national who resides in Canada, was arrested and charged in the U.S. District Court for the Western District of Washington with possession of a listed chemical that could be used to manufacture methamphetamine, possession of methamphetamine with intent to distribute, and possession of marijuana with intent to distribute.

NDIC Comment: Previous seizures from vehicles inspected at U.S.-Canada Border POEs have involved combinations of marijuana and ephedrine; however, it is uncommon for such seizures to also involve methamphetamine. Although methamphetamine smuggling from Canada into the United States is limited, reporting from CBP and ICE indicates that the amount of Canada-produced methamphetamine smuggled into the United States is increasing. As a result, methamphetamine seizures by CBP officials at large U.S.-Canada POEs likely will increase in the near term.

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**- INTELLIGENCE BRIEF -**

**NEURONTIN BEING DIVERTED AND DISTRIBUTED IN NEW HAMPSHIRE**

[From the NDIC *Narcotics Digest Weekly* 2004;3(35):1  
Unclassified, Reprinted with Permission.]

On July 22, 2004, Enfield Police Department officers seized the prescription depressant Neurontin while investigating illicit OxyContin distribution in western New Hampshire. During



the investigation, a 57-year-old male offered undercover officers 10 samples of Neurontin in various dosage amounts while selling them OxyContin. After arresting the alleged distributor on charges of distributing and selling controlled substances, officers searched the defendant's residence and found additional quantities of OxyContin and Neurontin as well as five loaded firearms. Officers learned that the defendant had received the OxyContin and Neurontin from two pharmacists, one in Tennessee and one in Florida. Officers believe that the defendant knew the Tennessee practitioner because the defendant had lived in Tennessee before moving to New Hampshire 2 years ago. The defendant allegedly was distributing the pharmaceuticals to Enfield area youths.

NDIC Comment: Neurontin rarely is encountered as a diverted pharmaceutical; however, law enforcement reporting indicates that the drug (sometimes referred to as Vitamin G) increasingly is being abused. Neurontin is the brand name of the pharmaceutical drug gabapentin and is distributed as a capsule (100 mg, 300 mg, and 400 mg dosages), tablet (600 mg and 800 mg dosages), and liquid (5 ml). The drug is a central nervous system depressant, and its effects include feelings of apathy, decreased position sense, euphoria, and hallucinations. It is not a scheduled drug under the federal Controlled Substances Act. Neurontin has been prescribed to treat epilepsy since 1993 and was approved by the U.S. Food and Drug Administration (FDA) to treat postherpetic neuralgia (shingles) in 2002. Some state public health agencies also report that Neurontin availability has increased in some areas because of overprescribing of the drug.

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#### **- INTELLIGENCE BRIEF -**

### **NORTH CAROLINA GOVERNOR SIGNS METHAMPHETAMINE LEGISLATION INTO LAW**

[From the NDIC *Narcotics Digest Weekly* 2004;3(35):2  
Unclassified, Reprinted with Permission.]

On August 3, 2004, the governor of North Carolina signed into law Senate Bill 1054 designed to reduce methamphetamine production and distribution. The new law increases criminal penalties for the unlawful manufacture of methamphetamine and for possession of ingredients used in methamphetamine production. The law also designates as second degree murder any death resulting from the distribution of methamphetamine. Finally, the law adds 2 years to a convicted methamphetamine manufacturer's sentence if a law enforcement officer or other emergency worker is injured in a methamphetamine laboratory seizure and increases the penalty for the presence, exposure, or endangerment of a child under 18 as a result of methamphetamine manufacturing.

NDIC Comment: Once concentrated in the Pacific region, domestic methamphetamine production now occurs to varying degrees in most areas of the country. The highest levels of methamphetamine production occur in the Pacific and Southwest regions. However, methamphetamine production in the Southeast region is significant and increasing. The number of clandestine laboratory responses reported by the North Carolina State Bureau of Investigation

in the first 6 months of 2004 (164) nearly equaled the number of responses reported in all of 2003 (177). Moreover, children were affected in 64 of the 164 cases in 2004, compared to 69 in 2003.

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**- INTELLIGENCE BRIEF -**

**PLACEBO OXYCONTIN TABLETS IN BREVARD COUNTY, FLORIDA**

The Florida Department of Law Enforcement Daytona Beach Crime Laboratory (Daytona Beach, Florida) recently received a large shipment (total net mass 31.6 grams, not counted) of apparent 40 milligram dosage Purdue Oxycontin tablets (photo not taken). The exhibit was submitted by the Brevard County Sheriff's Office (Brevard County is located to the immediate south of Daytona Beach). Analysis of a methanolic extract of two tablets by GC/MS, however, indicated no controlled substances. Subsequent discussions with Purdue confirmed that they produce placebo Oxycontin tablets. This was the first submission of such tablets to the laboratory.

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**- SAFETY ALERT -**

**MISSISSIPPI BUREAU OF NARCOTICS AGENT INJURED  
BY ANHYDROUS AMMONIA DURING A  
METHAMPHETAMINE LABORATORY SEIZURE**

[From the NDIC *Narcotics Digest Weekly* 2004;3(35):2  
Unclassified, Reprinted with Permission.]

On August 3, 2004, a Mississippi Bureau of Narcotics agent was injured while responding to a clandestine methamphetamine laboratory site near D'Iberville. The laboratory was located in a residence in a mobile home community and was reported by a citizen complaining of a strong chemical odor in the area. The 33-year-old resident was arrested and charged with manufacturing methamphetamine and aggravated assault on a police officer. According to the Head of Special Operations for the Bureau of Narcotics, the injured agent was enveloped in an anhydrous ammonia mist while taking a sample from a tank that was not designed for anhydrous ammonia storage. The agent had removed his breathing mask because of the high heat and humidity before attempting to take the sample. Fellow agents flushed the injured agent's eyes with water, and he was taken to a local medical center where he was treated and released.

NDIC Comment: The number of law enforcement officers injured at methamphetamine laboratories has increased dramatically in recent years. According to Drug Enforcement Administration (DEA) El Paso Intelligence Center (EPIC) National Clandestine Laboratory Seizure System (NCLSS) data, reported injuries to law enforcement officers nationwide responding to methamphetamine laboratory sites increased dramatically from 47 in 2000 to 123 in 2001, 127 in 2002, and 254 in 2003. Common injuries experienced by officers often involve

exposure to chemicals and combinations of chemicals used in the methamphetamine process that are caustic to skin tissue--frequently causing serious burns--and can affect the lungs, causing a series of conditions ranging from breathing difficulties to respiratory failure.

\* \* \* \* \*

## SELECTED REFERENCES

[Notes: Selected references are a compilation of recent publications of presumed interest to forensic chemists. Unless otherwise stated, all listed citations are published in English. If available, the email address for the primary author is provided as the contact information. Listed mailing address information (which is sometimes cryptic or incomplete) exactly duplicates that provided by the abstracting services. In addition, in order to prevent automated theft of email addresses off the Internet postings of *Microgram Bulletin*, unless otherwise requested by the corresponding author, all email addresses reported in the *Bulletin* have had the "@" character replaced by "-at-"; this will need to be converted back (by hand) before the address can be used.]

1. Goldmann T, Taroni F, Margot P. **Analysis of dyes in illicit pills (amphetamine and derivatives).** Journal of Forensic Sciences 2004;49(4):716. [Editor's Notes: Analysis for 14 dyes present in European ecstasy tablets is performed using SPE followed by TLC and/or CEC-DAD; the results can be used to link cases. Contact: Institut de Medecine Legale, The University of Lausanne, Rue de Bugnon 21, 1005 Lausanne, Switzerland.]
2. Hazekamp A, Choi YH, Verpoorte R. **Quantitative analysis of cannabinoids from Cannabis sativa using H1-NMR.** Chemical and Pharmaceutical Bulletin 2004;52(6):718. [Editor's Notes: Allows analysis of pure cannabinoids or cannabinoid mixtures from plant material in less than 5 minutes, without pre-purification. Contact: Leiden Univ, Div Pharmacognosy, Inst Biol, Einsteinweg 55, NL-2300 RA Leiden, Netherlands.]
3. Heegel RA, Knops LA, Northrop DM, Person EC. **Abbreviated reaction times in the red phosphorus - iodine manufacturing method.** Journal of the Clandestine Laboratory Investigating Chemists Association 2004;14(3):11. [Editor's Notes: Presents the title study; details withheld in accordance with *Microgram* policy. Note that this Journal (JCLICA) is law enforcement restricted. Contact: Washington State Patrol, Marysville Crime Laboratory, 2700 116th Street NE, Suite P, Marysville, WA 98271.]
4. Kurashima N, Makino Y, Sekita S, Urano Y, Nagano T. **Determination of origin of ephedrine used as precursor for illicit methamphetamine by carbon and nitrogen stable isotope ratio analysis.** Analytical Chemistry 2004;76(14):4233. [Editor's Notes: The title technique could easily differentiate between ephedrine of synthetic versus semi-synthetic versus biosynthetic origins, and the differences were found to carry through to the methamphetamine produced from those different origins of ephedrine. Contact: tlong -at- mol.f.u-tokyo.ac.jp .]
5. Love DW. **[Withheld] being utilized as a source of hydrogen peroxide for iodine recovery.** Journal of the Clandestine Laboratory Investigating Chemists Association 2004;14(3):9. [Editor's Notes: Describes the use of a commercial product as a source of hydrogen peroxide. The name of the product is withheld in accordance with *Microgram* policy. Note that this Journal (JCLICA) is law enforcement restricted. Contact: DEA Southwest Laboratory, 2815 Scott Street, Vista, CA 92081.]

6. Lurie IS, Hays PA, Parker K. **Capillary electrophoresis analysis of a wide variety of seized drugs using the same capillary with dynamic coatings.** *Electrophoresis* 2004;25(10-11):1580. [Editor's Notes: Compounds included phenethylamines, cocaine, oxycodone, heroin, LSD, opium, hallucinogenic mushrooms, and GHB/GBL. Contact: Drug Enforcement Administration, Special Testing and Research Laboratory, Dulles, VA 20166.]
7. Newton HR. **Indanylamphetamine identified.** *Journal of the Clandestine Laboratory Investigating Chemists Association* 2004;14(3):12. [Editor's Notes: Presents analytical data for 1-(5-indanyl)-2-aminopropane (commonly mis-named as "indanylamphetamine"), a recently encountered designer drug that is an analog of MDA. Note that this Journal (JCLICA) is law enforcement restricted. Contact: Indiana State Police, Indianapolis Laboratory (no further addressing information was provided).]
8. Palhol F, Lamoureux C, Chabrilat M, Naulet N. **N-15/N-14 Isotopic ratio and statistical analysis: An efficient way of linking seized Ecstasy tablets.** *Analytica Chimica Acta* 2004;510(1):1. [Editor's Notes: Presents the GC/C/IRMS analyses of MDMA from 106 samples. The results can be used for rapid grouping of similar tablets. Contact: Laboratoire des Douanes de Paris, 75141 Paris, France.]
9. Sabucedo AJ, Furton KG. **Extractionless GC/MS analysis of gamma-hydroxybutyrate and gamma-butyrolactone with trifluoroacetic anhydride and heptafluoro-1-butanol from aqueous samples.** *Journal of Separation Science* 2004;27(9):703. [Editor's Notes: Presents a novel technique for the derivatization and analysis of the title compounds directly from dilute aqueous solutions (i.e., beverages). Contact: Department of Chemistry and Biochemistry, Advanced Mass Spectrometry Facility and International Forensic Research Institute, Florida International University, Miami, FL 33199.]
10. Sarin RK, Srivastava S, Srivastava AK, Anil G, Reddy MRP. **Multielement determination in gum opium by microwave digestion and inductively coupled plasma optical emission spectroscopy.** *Chemical Papers* 2004;58(2):101. [Editor's Notes: Presents the analysis of Indian gum opium by the title technique (13 elements found in quantifiable levels). Contact: Central Forensic Science Laboratory, BPR and D, MHA, GO1, Hyderabad 500 013, India.]
11. Schieferecke J, Worley D. **Analysis of red phosphorus using a pyrolysis gas chromatograph/mass spectrometer.** *Journal of Analytical and Applied Pyrolysis* 2004;71(1):47. [Editor's Notes: For analysis of red P found in clandestine methamphetamine sites. Contact: Kansas Bureau of Investigation Headquarters Laboratory, Topeka, KS 66612.]
12. Tsai CH, Fang C, Liu JT, Lin CH. **Stacking and low-temperature technique in nonaqueous capillary electrophoresis for the analysis of 3,4-methylenedioxymethamphetamine.** *Electrophoresis* 2004;25(10-11):1601. [Editor's Notes: Presents the novel title technique; includes analysis of an illicit sample. Contact: Natl Taiwan Normal Univ, Dept Chem, 88 Sec 4, Tingchow Rd, Taipei, Taiwan.]
13. Zhang C-S, Liu K-l, Zheng H, He Y, Wang Z-h, Wang J. **Investigation of rolling pills by GC/MS.** *Wuhan Huagong Xueyuan Xuebao* 2004;26(1):9. [Editor's Notes: Abstract (and title) are unclear - appears to be an analysis of a case of tablets containing methamphetamine, ephedrine, caffeine, and ketamine. This article is written in Chinese. Contact: Institute of Forensic Science of Public Security Ministry of China, Beijing 100038, Peop. Rep. China.]

#### Additional References of Possible Interest:

1. Haller CA, Duan M, Benowitz NL, Jacob P. **Concentrations of ephedra alkaloids and caffeine in commercial dietary supplements.** Journal of Analytical Toxicology 2004;28:145. [Editor's Notes: Presents a novel LC-MS/MS technique for performing the title analysis; 35 products were analyzed. Contact: University of California - San Francisco, Division of Clinical Pharmacology, Box 1220, San Francisco, CA 94143.]
2. Hsieh H-M, Hou R-J, Chen K-F, Tsai L-C, Liu S-W, Liu K-L, Linacre A, Lee JC-I. **Establishing the rDNA IGS structure of Cannabis sativa.** Journal of Forensic Sciences 2004;49(3):477. [Editor's Notes: Presents the title study. The authors indicate that the technique can be used to identify and classify samples. Contact: Department of Forensic Science, Central Police University, Kwei-San, Taoyuan, Taiwan 33334, Taiwan.]
3. Keim PS, Zinnamon K. **DNA fingerprinting for Cannabis sativa (marijuana) using short tandem repeat (STR) markers.** PCT Int. Appl. WO 2004008841 A2 29 Jan 2004. CLASS: IC: A01H. APPLICATION: WO 2003 - US22887 21 Jul 2003. PRIORITY: US 2002 - PV397179 19 Jul 2002. [Editor's Notes: Eight STR loci were identified, which allow identification and classification of marijuana. Contact: Arizona Board of Regents, Arizona State University, USA (no further addressing information was provided).]
4. Komiyama Y, Hori Y, Namera A, Kuroki Y. **Barbiturates.** Japanese Journal of Toxicology 2004;17(1):79. [Editor's Notes: A minor review on two methods for analysis of barbiturates; focus is toxicological. This article is written in Japanese. Contact: Dep. Clin. Exam. Med., Kansai Med. Univ., Japan.]
5. Raharjo TJ, Verpoorte R. **Methods for the analysis of cannabinoids in biological materials: A review.** Phytochemistry Analysis 2004;15:79. [Editor's Notes: Focus is biological, but covers a wide variety of techniques. Contact: Division of Pharmacognosy, Leiden University, Gorlaeus Laboratories, P.O. Box 9502, 2300 RA Leiden, The Netherlands.]
6. Rao RN, Parimala P, Khalid S, Alvi SN. **Detection of the adulteration of traditional alcoholic beverages by the separation and determination of alprazolam, chloral hydrate, and diazepam using reversed-phase high-performance liquid chromatography.** Analytical Sciences 2004;20(2):383. [Editor's Notes: Presents the title study; 200 seized samples were analyzed. Contact: HPLC Group, Division of Analytical Chemistry, Indian Institute of Chemical Technology, Hyderabad, 500 007 India.]
7. Schuetz H, Verhoff MA. **Designer drugs: Effects and clinical - toxicological interactions.** MTA Dialog 2004;5(2):90. [Editor's Notes: A minor review on (unspecified) designer drugs. This article is written in German. Contact: Institut fuer Rechtsmedizin, Universitaetsklinikum Giessen, 35392 Giessen, Germany.]
8. Smyth WF, Brooks P. **A critical evaluation of high performance liquid chromatography - electrospray ionization - mass spectrometry and capillary electrophoresis - electrospray - mass spectrometry for the detection and determination of small molecules of significance in clinical and forensic science.** Electrophoresis 2004;25(10-11):1413. [Editor's Notes: An extensive review of the title topics for the period 2000 - 2003. Several controlled substances are included among the wide variety of discussed applications. Contact: School of Biomedical Sciences, University of Ulster, Coleraine, UK.]

9. Terabe S. **Micellar Electrokinetic Chromatography**. Analytical Chemistry 2004;76(13):240A. [Editor's Notes: A minor overview and review of the title topic. Contact: University of Hyogo, Japan (no further addressing information was provided).]
10. Thormann W, Verpoorte S, Caslavsky J, McCord B. **Capillary electrophoresis in clinical and forensic analysis**. Electrophoresis 2004;25(10-11):U6. [Editor's Notes: A minor overview and review of the title topic. Contact: No contact information was provided in the abstract.]
11. Yudko E. MDMA. **Methamphetamine Use**. 2003:25. [Editor's Notes: A minor review on MDMA; focus appears to be toxicological. Contact: University of Hawaii at Hilo, USA (no further addressing information was provided).]

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## NEW EMAIL ADDRESSES NEEDED

The email addresses for the following organizations have returned rejection notices to the *Microgram* Editor for the past three issues of *Microgram Bulletin*, and will therefore be dropped from the subscription list unless a corrected email address is provided by December 31, 2004. Note that the errors include anti-spamming, mailbox full, user not found, or user unknown messages. The Editor requests your assistance in contacting these organizations, determining if they wish to remain on the *Microgram* subscription e-net, and if so asking them to provide a valid email address to the Editor at: [microgram\\_editor-at-mailsnare.net](mailto:microgram_editor-at-mailsnare.net)

[None this issue.]

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### The following organizations (listed in the July issue) were dropped on 12/1/04:

Bexar County Medical Examiner's Office, San Antonio, Texas

Carabinieri Investigazioni Scientifiche Raggruppam, 00165 Rome, Italy

Louisiana State Police, North Delta Criminalistics Laboratory, West Monroe, Louisiana

New Hampshire Department of Corrections, Drug Testing Laboratory, Laconia, New Hampshire

Racine Health Department, Racine, Wisconsin

Washington State Department of Health, Olympia, Washington

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## THE DEA FY - 2005 STATE AND LOCAL FORENSIC CHEMISTS SEMINAR SCHEDULE

The FY - 2005 schedule for the DEA's State and Local Forensic Chemists Seminar is as follows:

December 6 - 10, 2004  
February 7 - 11, 2005  
May 9 - 13, 2005  
July 11 - 15, 2005  
September 19 - 23, 2005

Note that the school is open only to forensic chemists working for law enforcement agencies, and is intended for chemists who have completed their agency's internal training program and have also been working on the bench for at least one year. There is no tuition charge for this course. The course is held at the AmeriSuites Hotel in Sterling, Virginia (near the Washington/Dulles International Airport). A copy of the application form is reproduced on the last page of the August 2004 issue of *Microgram Bulletin*. Completed applications should be mailed to the Special Testing and Research Laboratory (Attention: Pam Smith or Jennifer Kerlavage) at: 22624 Dulles Summit Court, Dulles, VA 20166. For additional information, call 703/668-3337.

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## SCIENTIFIC MEETINGS

### 1. Title: AAFS 57th Annual Meeting

(Second Posting)

**Sponsoring Organization:** American Academy of Forensic Sciences

**Inclusive Dates:** February 21 - 26, 2005

**Location:** New Orleans, LA

**Contact Information:** See Website

**Website:** [www.aafs.org](http://www.aafs.org)

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## EMPLOYMENT OPPORTUNITIES

### 1. University of Massachusetts Medical School

(Second Posting)

**Position:** Laboratory Analyst II (Two Positions)

**Location:** Worcester, Massachusetts

**Salary Range:** \$32,032 - \$39,915, Commensurate with Experience

**Application Deadline:** Open Until Filled

**Duties:** Performs analytical analysis of evidence for identification and/or quantitation, records information. Performs and documents routine maintenance of equipment. Develops new assays and evaluates new equipment. Trains new personnel. Provides testimony in court when necessary. Advises and aides DAL Evidence Officer on identification, classification, and handling of evidence.

**Qualifications:** B.S. in Chemistry or equivalent (requires strong emphasis on Chemistry) plus 3 years relevant experience or Master's Degree in Chemistry in Forensic Science or equivalent and two years of relevant experience. Strong oral and written communicative skills necessary for interaction with other medical center staff as well as outside agencies.

**Application Procedures:** Apply on-line at: [www.umassmed.edu](http://www.umassmed.edu). Search keyword: 04-1360. Or mail/fax a resume to: University of Massachusetts Medical School, Human Resources, 419 Belmont Street, Worcester MA 01604; fax 508-856-2390.

**2. Dupage County Crime Laboratory**

(Second Posting)

**Position:** Forensic Scientist II (Drug Chemistry)

**Location:** Wheaton, Illinois

**Salary Range:** \$37,700 - \$56,500

**Application Deadline:** Open Until Filled

**Duties:** Under immediate supervision, performs work in the examination, analysis and evaluation of physical evidence and unknown substances. Performs microscopical, chemical, chromatographic, and spectrophotometric analysis of unknown substances. Writes reports detailing the results of analysis and testifies as an expert witness in judicial proceedings. This is not an exhaustive list of responsibilities and other associated tasks may be expected.

**Qualifications:** Must have a bachelor's degree and two years full time drug analysis experience. It is preferred that the applicant has court-testimony experience (been accepted as an expert witness in the drug chemistry discipline). Trainees will not be considered for this position. Hired applicant will be required to successfully complete a competency test prior to assuming independent casework.

**Application Procedures:** If you meet the minimum qualifications and want to be considered for this position, please mail or email a resume or CV to:

Director John Collins  
Crime Laboratory Director  
DuPage County Sheriff's Office Crime Laboratory  
501 N. County Farm Road  
Wheaton, IL 60187  
jcollins -at- dupageco.org

Additional Information: Please contact Supervisor Carina Thomas at (630) 407-2096, or cthomas -at- dupageco.org

Equal Opportunity Employer

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# Computer Corner

Standards, Reference Collections, and Controls

## #186

by Michael J. Phelan  
DEA Digital Evidence  
Laboratory

Digital evidence examiners utilize a variety of analytical techniques. Some of the most powerful involve the comparison of the evidence with a known value or set of known values. However, the assertion by an examiner that there is or is not a match should always be caveated with an understanding of the reliability of the known value(s) that has/have been used to make the comparison.

Digital evidence examiners have a variety of known value(s) tools that are available for use in most examinations. The most exacting type of known values are “standards”, followed in declining order of authority by “reference collections”, and then “controls”.

Known values are used for a variety of purposes, including calibration of instrumentation, identification of data that is of potential probative value, and elimination of data that is known to not be of probative value. Computer Forensic examination software such as Encase, Forensic Tool Kit, and Ilook support comparison analyses (matching of files or file fragments), using either external values or examiner generated values. The matching technique may be a direct byte-for-byte comparison, or instead utilize a digital data summation commonly referred to as

“hashing”.

### Hash Calculation

A hash calculation is a “summary value” (also known as a “digest value”) for a select set of digital data (as small as a file, or as large as the collective contents of a hard drive) that is derived from the actual data via a complex mathematical algorithm (formula). As a (highly) simplified example, a hash algorithm could derive a value using an equation such as: Summary Value = the sum of all the binary bits in a select data set divided by a constant (such as 12345). The summary value therefore characterizes a collection of binary data with a calculated degree of certainty that measures the probability of uniqueness of two binary data sets compared to one another (that is, what chance that they match). The algorithm type, and the size of the summary value, are the critical parameters that determine the degree of authority of a hash calculation. In general, the larger the hash value (40, 64, 128 or 256 bits), the greater the certainty that two data sets are the same if their hash values match.

There are a number of industry accepted hash algorithms. The two most commonly used for digital evidence comparisons are MD-5 and SHA-1. The former is a method developed by

Ronald L. Rivest of the Massachusetts Institute of Technology, while the latter was developed by the U.S. National Institute of Standards.

Typically, a hash value is expressed as a pattern of hexadecimal information such as:  
“015A6BF77EC100A428617D”  
Hexadecimal values (consisting of a base 16 mathematical system) are used to represent large numbers in a fixed length expression. For example, the base 10 values of 10, 256, and 4096 are represented in hexadecimal systems as, “A”, “FF”, and “1000”, respectively. (Note that larger values are stored in smaller numeric representations when using the Base 16 numbering system). This is why a hash value can look deceptively simple, even though it may represent a very large amount of data.

Both the MD-5 and SHA-1 algorithms have calculated estimates of uncertainty. The MD-5 algorithm calculates a 128 bit summary, resulting in a probability of 1:1038 chances of a duplicate value occurring from different data sets. The SHA-1 algorithm calculates a 160 bit summary, resulting in a probability of 1:1080 chances of a duplicate value occurring from different data sets. In reality, these are both infinitesimally

small probabilities, and so either are currently considered industry acceptable measures of uniqueness.

### **Standards**

A standard for the digital evidence community would consist of a value, which is traceable to a known, which has been authenticated by a recognized calibration laboratory such as the National Institute of Standards. Digital evidence can utilize standards, but only in certain types of applications. For example, digital audio forensics could use wave generators to calibrate audio signal filters. Similarly, digital video forensics could use a standard to calibrate color hue, brightness, and saturation, or establish a gray scale using a calibration black and white standard.

### **Reference Collection**

A digital evidence reference collection is a compendium of summary or hash values of files that are known to be of probative value (or are known to not be of probative value). Such reference collections are maintained by organizations that have an investigative mandate or a subject matter interest. Reference collections should have a traceable media history (that documents the who, what, when, where, and why a file was included in the collection). Reference collections should also have some type of quality review or peer review, use a documented methodology, and allow an estimate of uncertainty to be calculated. An example of an investigative reference collection is the U.S. Customs

Service's (now the Bureau of Immigration and Customs Enforcement's) National Children Victim Identification Program (NCVID). This is a collection of prosecutable child exploitation pictures, wherein the victim has been positively identified. This data permits the rapid identification of picture files (in JPG, GIFF, or AVI format), by first calculating a hash of each image file and comparing it to the NVCID set of reference hashes. This technique is known as "positive" hashing, since the examiner is trying to positively match suspect file hashes to previously documented and verified file hashes of known probative value. Positive hash files are commonly referred to as "notable".

As noted above, reference collections are not always of material of probative value. For example, the National Institute of Standards produces the National Standard Reference Library (NSRL), a hash data set which contains hash calculations of notable files such as application software that encrypt data, hide data using steganography, or capture keystroke data. It may be important for an examiner to know if such programs exist on the evidence currently being examined.

Other types of reference collections of non-probative value consist of hash calculations of files that are part of a normal operating system, or of routine application software such as word processing, financial, e-mail communication,

executable programs (.exe files), or application modules (.dll). These types of files are found in abundant quantities on all Microsoft computer systems. A typical desktop or laptop computer may have 10,000 to 50,000 of these files. Use of one or more reference collection comparisons should result in these files being identified as "safe" and therefore excludable from computationally intensive search tasks, thereby significantly reducing overall search time. The ability to search using a known file filter approach can result in 25% to 75% of all files being eliminated. For example, a recent test by DEA's Digital Evidence Laboratory resulted in 84 percent of the Windows XP and Microsoft Office Suite files being identified using two leading computer forensic hash data sets – those from the NSRL and the National Drug Intelligence Center's Hash Keeper set. It should be noted that the NSRL hash set (four CD's) also includes foreign language versions of the Microsoft operating system files. This feature can be very valuable in examinations of computers set up using languages other than English. Updates that include new releases or software patches (that are different, and therefore have their own unique hash values) are released quarterly.

### **Limitations**

The use of hash sets as an authoritative matching or exclusionary tool is a well-defined process; however, there are evidentiary issues that digital evidence examiners need to consider.

For positive or notable hash sets, the source's documentation should be researched. For example, there are many child exploitation hash offerings posted on Internet bulletin boards that do not meet current local, state, or Federal prosecution standards. A validated reference collection will have supporting documentation that specifies the original investigative source(s). Non-validated hash data, or hash sets lacking supporting documentation, may cause investigators to make conclusions that are not supportable in Court. It is incumbent upon the digital evidence laboratory to use only those hash sets that are determined to be documented and valid.

For negative or "safe" hash sets, the need to have a traceable media history is important to verify the hashes, and to avoid the exclusion of digital data that may be pertinent. Additionally, there is a technical issue that a negative or safe hash be collected from the installed version as opposed to the distribution version contained on a CD or a ".CAB" installation file, because the installation process modifies some files. [Ideally, both the distribution and installed versions should be included in order to maximize the comprehensiveness of the hash set.]

### **Controls**

Controls are either hash sets or exemplar files (designed for byte-by-byte comparison) that are created to test an analytical instrument (usually the computer

being used in a digital evidence examination) and its attendant software. The test demonstrates that the instrument is operating properly prior to the initiation of a critical evidence examination process such as evidence duplication or examination. A control may also be used to test a new piece of software to verify that it is operating properly. Typical control files may be as simple as a keyword list in ASCII text, or may consist of complex file signatures (header and footer data) for data carving. The use of a control should be documented in the examination notes or instrument log book.

### **Scripts**

A script is a set of instructions (often referred to as a batch program) that contains commands to sequentially perform a number of pre-defined processes. For example, a simple script could include commands such as: 1) List all file names with creation, edit, and last access dates; 2) List all software registration information; 3) List clock setting times (and so on). If the script is packaged, validated, and supported as part of the base examination software, then it is merely an extension of the base examination tool - which should have been already validated prior to use. However, if the script is part of a vendor-supported library or software add-on program that performs a specialized function used in all or some examinations, then it is part of a reference collection that the digital laboratory needs to manage. Furthermore, if the

script is instead a program used to analyze evidence by performing a one-time process, then the documentation and testing (prior to using the script) should be included in the examiner's case notes. Testing of a script for a one-time use at DEA requires prior laboratory supervisory approval, because it is examination activity outside of the approved standard operating procedures. The test usually consists of evaluation of data that has already been previously analyzed or verified through other means.

The use of standards, reference collections, and controls in a digital evidence laboratory can be a complex task, but one that can result in faster examination search speeds and positive identification of digital data of potential probative value. Laboratory manager and examiners must be aware of how comparison data sets are used, understand their limitations, and lastly ensure that the data sets are properly validated.

Questions or comments?  
Email: Michael.J.Phelan -at- usdoj.gov

# Microgram

## *Bulletin*

**Published by:**

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Office of Forensic Sciences  
Washington, DC 20537**

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**VOL. XXXVII, NO. 10**

**OCTOBER 2004**

**- INTELLIGENCE ALERT -**

**COCAINE IN LARGE ALUMINUM MEDALLIONS FROM GUATEMALA  
AT JFK AIRPORT**

The DEA Northeast Laboratory (New York, NY) recently received two large aluminum medallions containing a white powder, suspected cocaine (see Photo 1). The medallions were seized by U.S. Customs and Border Protection agents from the luggage of a passenger arriving on a flight from Guatemala to JFK Airport. Each medallion was made of cast aluminum, weighted



**Photo 1**

7.3 kilograms, and was approximately 17 inches in diameter and one inch thick. The front of



each medallion had a depiction of a 25 Centavo coin (unknown if a "correct" depiction of any actual coinage), while the back was blank. Initial access to the contents was achieved by drilling a small hole in the back; after field-testing indicated cocaine, the internal cavities were accessed to recover all of the remaining powder. Analysis of the powder (total net mass 1.94 kilograms) by microscopy, FT-IR, GC/FID, and GC/MS confirmed 65 percent cocaine hydrochloride and phenacetin. The Northeast Laboratory routinely receives a variety of exhibits with different concealment techniques, but this is the first time that cocaine was encountered within large aluminum medallions.

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**- INTELLIGENCE ALERT -**

**HEROIN-SATURATED CARDBOARD SHEETS IN LUGGAGE  
FROM CALI, COLOMBIA IN MIAMI AIRPORT**

The DEA Southeast Laboratory (Miami, Florida) recently received two black leather, soft-sided suitcases, each containing two cardboard baffles with some adhering tan powder, suspected heroin (see Photo 2). The suitcases were seized by the U.S. Immigration and Customs Enforcement, Miami Airport Narcotics Group from a flight arriving from Cali, Colombia. The cardboard sheets measured approximately 3 x 2 feet, and were hidden in false sides in the suitcases (total net mass of



**Photo 2**

Exhibit 1: 2359 grams; total net mass of Exhibit 2: 1724 grams). Analysis by GC, GC/MS, and FTIR-ATR confirmed 72 and 69 percent heroin hydrochloride, respectively, in the two exhibits. The laboratory routinely receives absorbent materials laced with controlled substances.

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**- INTELLIGENCE ALERT -**

**METHAMPHETAMINE WITH PROCAINE IN BEAUMONT, TEXAS**

The DEA South Central Laboratory (Dallas, Texas) recently received a commercial cigarette pack containing a zip lock plastic bag containing 26.5 grams of a white powder, suspected methamphetamine (see Photo 3, next page). The exhibit was acquired by DEA agents from the

Beaumont (Texas) Resident Office. Analysis of the powder (total net mass was 26.5 grams) by FTIR, GC/MS, and HPLC confirmed 68 percent d-methamphetamine hydrochloride, approximately 20 percent procaine hydrochloride, and dimethyl sulfone. This is one of only a dozen times this laboratory has seen procaine HCl mixed with methamphetamine since 1970. In the analyst's experience, this concealment technique (that is, inside a cigarette pack) is more commonly associated with marijuana, not methamphetamine.



**Photo 3**

\* \* \* \* \*

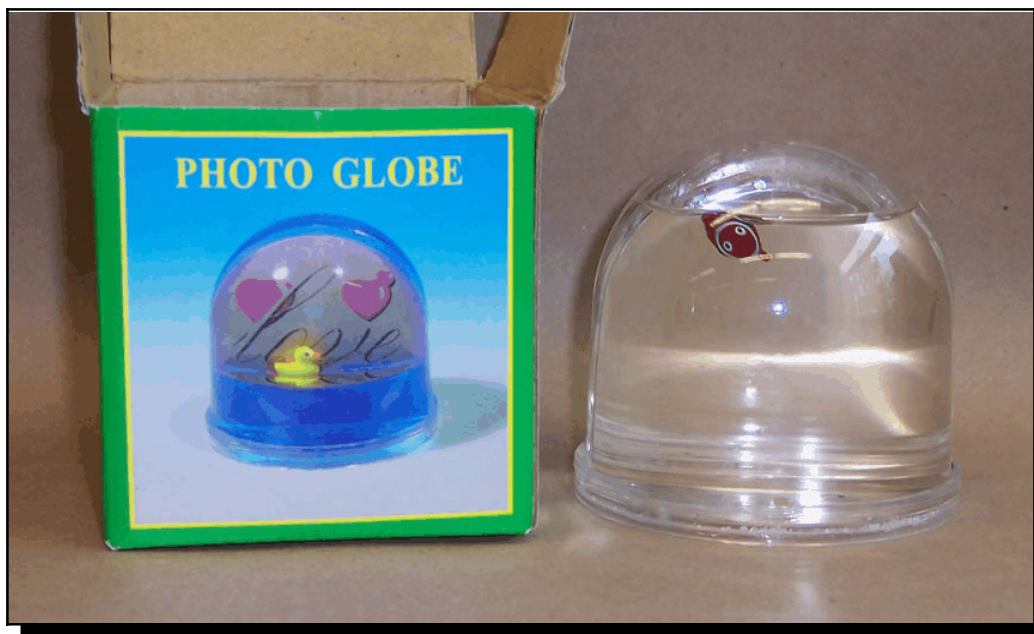
**- INTELLIGENCE ALERT -**

**METHAMPHETAMINE IN AN ANTIPERSPIRANT ROLL-ON  
AND A PHOTO GLOBE IN GUAM**

The DEA Southwest Laboratory (Vista, California) recently received a commercial antiperspirant roll-on with dried white crystals around the cap-threads and a photo globe, both suspected to contain methamphetamine (see Photos 4, right, and Photo 5, next page). The exhibits were seized by agents from the DEA Guam Field Office from a passenger arriving at the Guam airport on a flight from the Phillipines. The dried crystals in the cap-threads of the roll-on (see Photo 4) field-tested positive for methamphetamine. The roll-on (4.5 inches tall with its cap on) contained 30 milliliters of a clear, colorless liquid with a pH of 7 and a blue reaction with Watesmo paper (positive for water); the liquid had a strong perfume odor. Analysis by GC, FTIR-ATR, and LC confirmed 616 milligrams per milliliter of methamphetamine hydrochloride. The photo globe (4 x 3.5 inches) contained 210 milliliters of a clear, colorless liquid with a pH of 7 and a blue reaction with Watesmo. Analysis by FTIR-ATR and LC confirmed 611 milligrams per milliliter of methamphetamine hydrochloride. These are believed to be the first exhibits of these types submitted to the laboratory.



**Photo 4**



**Photo 5**

\* \* \* \* \*

**- INTELLIGENCE ALERT -**

**INVESTIGATORS SEIZE THREE-LEAFED CANNABIS PLANTS  
IN BEEKMANTOWN, NEW YORK**

[From the NDIC *Narcotics Digest Weekly* 2004;3(37):2  
Unclassified, Reprinted with Permission.]

On August 24, 2004, investigators from the Adirondack Drug Task Force seized 13 cannabis plants that had three-fingered leaves instead of the traditional five. Investigators found the plants in a Beekmantown (Clinton County) field growing in crates that were concealed among blackberry bushes. The plants were approximately 4 feet tall, and buds were developing on many of the plants. Investigators found the plants after an individual provided them with a tip. No arrests were made at the time of the seizure, and the plants have not been analyzed in a laboratory. Task force investigators report that over the past 3 to 4 years there have been several seizures in Clinton County of three-fingered leaf cannabis plants as well as one seizure of single-fingered leaf cannabis plants. Agencies participating in the Adirondack Drug Task Force include the Clinton County Sheriff's Department, Plattsburgh Police Department, New York State Police, DEA, and U.S. Border Patrol (USBP).

NDIC Comment: Traditionally, cannabis plants are thought of as having five leaves; however, the number of leaves on a cannabis plant can vary (although it usually has an odd number of leaves such as three or seven). This seizure follows a widely publicized April 2004 seizure of four immature cannabis plants with three-fingered leaves from an indoor grow in Thunder Bay, Ontario. The plants seized in Thunder Bay were atypical in appearance, however, having

twig-like stalks and broad, rounded leaves, which led to reports of the discovery of a new strain of cannabis. What may be more likely in both of these seizures is that it is an unintentional occurrence of whorled phyllotaxy. In botany, leaf phyllotaxy describes how leaves are arranged on a stem and in relation to one another. Whorled phyllotaxy means three or more leaves at one node of a stem. Information gained through online canvassing reveals that this may be a somewhat common occurrence when growing cannabis. The limited information also suggests that whorled phyllotaxy occurred in plants cultivated from clones of normal plants, and many incidents involved indica varieties, which typically have broader leaves than sativa varieties. Whether whorled phyllotaxy has an effect on plant yield or potency is uncertain. Some growers hopefully suggest that the THC levels of such plants will be higher, while others report that this leaf arrangement previously manifested in plants found to be inferior or male (no buds). The plants seized in Thunder Bay had not yet developed buds and tested at only 1.8 to 2.6 percent THC.

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**- INTELLIGENCE ALERT -**

**COMPANY ANNOUNCES NEW ANHYDROUS AMMONIA ADDITIVE  
DESIGNED TO DETER THEFT**

[From the NDIC *Narcotics Digest Weekly* 2004;3(37):4  
Unclassified, Reprinted with Permission.]

Royster-Clark Inc. announced that on September 15, 2004, it will begin marketing a chemical additive designed to reduce the incidence of thefts of anhydrous ammonia (a common agricultural fertilizer that also is used in illicit methamphetamine production). According to company representatives the additive, named GloTell™, works by dyeing anhydrous ammonia fluorescent pink. If thieves handle the fertilizer, the additive leaves a visible fluorescent pink stain on their skin and clothing. The highly visible stains, even if washed off, are still detectable under ultraviolet light for 24 to 72 hours. The fluorescent pink color also can alert farmers to valves, hoses, or tanks that have been tampered with or are leaking the potentially deadly gas. Additionally, company representatives assert that methamphetamine produced with anhydrous ammonia containing the additive becomes an unbleachable pink color, and the methamphetamine takes longer to dry (24 to 48 hours) because of the additive's water retention properties. Moreover, methamphetamine produced with GloTell™ may leave telltale pink marks on an abuser's nose if snorted or arms if injected. Company representatives state that the additive, which can withstand the cold, corrosive nature of anhydrous ammonia, will not harm the environment, crops, or humans. GloTell™ will be sold in 30-ounce jugs through 250 outlets nationwide. Approximately 1.5 ounces of the additive are needed to treat 1 ton of anhydrous ammonia and will add approximately \$9 per ton to the chemical's current cost of approximately \$240 per ton.

[Editor's Notes: This Alert is provided for informational purposes only, and should not be regarded as an endorsement by the U.S. Government. The DEA cannot comment on the efficacy or usefulness of this product.]

**- INTELLIGENCE ALERT -**

**LARGE SHIPMENT OF MARIJUANA CONCEALED IN PIECES OF POTTERY  
IN INMAN, SOUTH CAROLINA**

[From the NDIC *Narcotics Digest Weekly* 2004;3(39):2  
Unclassified, Reprinted with Permission.]

On September 1, 2004, investigators for U.S. Immigration and Customs Enforcement (ICE), Spartanburg County Sheriff's Office, and South Carolina State Transport (STAR) Team seized more than 1,600 pounds of marijuana and arrested four individuals. Investigators made the seizure while conducting a joint investigation on suspicious activity occurring at an Inman "nightclub and pottery business." On the afternoon of September 1, investigators observed a tractor-trailer arrive at the business. Three men immediately began unloading large pieces of pottery from the trailer and continued unloading the trailer, even through pouring rain, for approximately 6 hours. After dark, the three men left in a different truck and were stopped by STAR officers. During an inspection of the truck, STAR officers discovered two multipound "bricks" of marijuana in the vehicle. The three men were arrested for possession of marijuana, and county investigators obtained a search warrant for the Inman business. Upon executing the search warrant, investigators discovered approximately 1,600 pounds of marijuana concealed in 3-foot-tall clay pedestals. Investigators also arrested a fourth man found inside the business during the search. All four defendants are believed to be Mexican nationals, and investigators suspect that the shipment was smuggled over the Southwest Border. ICE officials report that the case will be presented to the U.S. Attorney's Office for the District of South Carolina for federal prosecution.

NDIC Comment: Law enforcement reporting indicates that over the past few years Mexican drug traffickers have been increasingly using locations in the Carolinas to break down large shipments (over 1,000 lb) of Mexico-produced marijuana that were smuggled across the Southwest Border. A similar seizure occurred in November 2003 when officers in York County--which is approximately 30 miles from Spartanburg County--seized over 2,000 pounds of marijuana that was being offloaded from a tractor-trailer into other vehicles. Much of the marijuana transported to the area likely is destined for distribution in areas of South Carolina and North Carolina (particularly the Charlotte metropolitan area); however, some is probably destined for other areas in the Southeast and Mid-Atlantic regions.

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**- INTELLIGENCE BRIEF -**

**VERY LARGE METHADONE LABORATORY SEIZED  
NEAR ST. PETERSBURG, RUSSIA**

The Organized Crime Control Section of the St. Petersburg (Russia) Police recently seized a clandestine methadone production laboratory in the Kirov District (located east-southeast of St. Petersburg). The seizure culminated a long-term investigation of illicit methadone trafficking



and abuse in the St. Petersburg area. The total amount of methadone seized was 18.7 kilograms, by far the largest ever seizure of methadone in Russia. According to the local authorities, the methadone had a street value of between four and four and a half million (U.S.) dollars. Three suspects were arrested (further details unavailable).

\* \* \* \* \*

**- INTELLIGENCE BRIEF -**

**ECSTASY MIMIC TABLETS WITH A SUNFLOWER LOGO CONTAINING  
COCAINE IN NEW YORK CITY**

The DEA Northeast Laboratory (New York, NY) recently received 790 round, off-white tablets with a sunflower logo, suspected ecstasy (see Photo 6). The tablets were acquired in New York City by agents from the DEA New York Division. Analysis of the tablets (total net mass 215.8 grams) by GC/FID and GC/MS, however, indicated not MDMA but rather 7.6 percent cocaine calculated as the hydrochloride salt (20 milligrams per tablet), along with



**Photo 6**

acetaminophen, caffeine, and a small amount of propoxyphene (salt form and isomer of propoxyphene not determined). This was the first submission of cocaine in tablet form to the Northeast Laboratory, and is believed to be the first submission of tablets with a sunflower logo.

\* \* \* \* \*

**- INTELLIGENCE BRIEF -**

**INTERNET-BASED DISTRIBUTORS OF 2C-T-21 CHARGED IN CONNECTION  
WITH THE DEATH OF A LOUISIANA MAN**

[From the NDIC *Narcotics Digest Weekly* 2004;3(39):4  
Unclassified, Reprinted with Permission.]

Federal agents in Baton Rouge, Louisiana, report that the owner of an Internet-based company has been indicted for illegally using the company to distribute controlled substances. One of the charges alleges that a 22-year-old man from St. Francisville, Louisiana, died after abusing 2C-T-21 that he purchased through the company's web site. Two 25-year-old men operated the company, which sold the drug with a disclaimer that it was for research and not for human consumption. The charges resulted from a federal investigation called Operation Web Tryp that



culminated in July 2004. The Las Vegas-based owner of the Internet-based company was indicted on July 14, 2004, in the U.S. District Court for the Middle District of Louisiana and was arrested on July 21, 2004, at his Las Vegas home. At the time of the owner's arrest, federal agents also found evidence that implicated the owner's roommate. The roommate was subsequently charged with four counts of distribution of analogs of controlled substances.

NDIC Comment: 2C-T-21 is a common name for the synthetic drug 2,5-dimethoxy-4-(2-fluoroethylthio)phenethylamine. 2C-T-21 belongs to a category of hallucinogens called phenethylamines and is an analog of the Schedule I controlled substance 2C-T-7.

\* \* \* \* \*

## SELECTED REFERENCES

[Notes: Selected references are a compilation of recent publications of presumed interest to forensic chemists. Unless otherwise stated, all listed citations are published in English. If available, the email address for the primary author is provided as the contact information. Listed mailing address information (which is sometimes cryptic or incomplete) exactly duplicates that provided by the abstracting services. In addition, in order to prevent automated theft of email addresses off the Internet postings of *Microgram Bulletin*, unless otherwise requested by the corresponding author, all email addresses reported in the *Bulletin* have had the “@” character replaced by “-at-”; this will need to be converted back (by hand) before the address can be used.]

1. Aalberg L, DeRuiter J, Sippola E, Clark CR. **Gas chromatographic optimization studies on the side chain and ring regioisomers of methylenedioxymethamphetamine.** *Journal of Chromatographic Science* 2004;42(6):293. [Editor's Notes: Abstract not available. Contact: Auburn Univ, Dept Pharmacol Sci, Sch Pharm, Auburn, AL 36849.]
2. Amundsen LK, Kokkonen JT, Rovio S, Siren H. **Analysis of anabolic steroids by partial filling micellar electrokinetic capillary chromatography and electrospray mass spectrometry.** *Journal of Chromatography A* 2004;1040(1):123. [Editor's Notes: Presents the title analysis on six steroids (androstenedione, metandienone, fluoxymesterone, methyltestosterone, 17-epimetandienone, and testosterone). Contact: VTT Processes, FIN-02044 Espoo, Finland.]
3. Blinc R, Apih T, Seliger J. **Nuclear quadrupole double resonance techniques for the detection of explosives and drugs.** *Applied Magnetic Resonance* 2003;25(3-4):523. [Editor's Notes: Drugs not specified in the abstract. Contact: J. Stefan Institute, Ljubljana, Slovenia.]
4. Dayrit FM, Dumlaog MC. **Impurity profiling of methamphetamine hydrochloride drugs seized in the Philippines.** *Forensic Science International* 2004;144(1):29. [Editor's Notes: Presents a cluster analysis study of trace impurities in seized methamphetamine samples. Contact: Chemistry Department, Ateneo de Manila University, Loyola Heights, Quezon City, Philippines.]
5. Fitsev IM, Blokhin VK, Budnikov GK, Fitseva NA. **Chemical - analytical diagnostics in criminalistic examination of materials, substances, and products.** *Zavodskaya Laboratoriya, Diagnostika Materialov* 2004;70(4):3. [Editor's Notes: Includes discussion of (unspecified)]

drugs and psychotropic substances. This article is written in Russian. Contact: Russia (no further addressing information was provided).]

6. Iqbal R, Rizvi SAA, Akbay C, Shamsi SA. **Chiral separations in microemulsion electrokinetic chromatography - Use of micelle polymers and microemulsion polymers.** Journal of Chromatography A 2004;1043(2):291. [Editor's Notes: Presents the title analysis on a series of barbiturates (drugs and matrices not specified in the abstract). Contact: Georgia State Univ, Ctr Biotechnol & Drug Design, Dept Chem, Atlanta, GA 30303.]
7. Kala M, Adamowicz P. **Pemoline tablets from the Polish drug market.** Z Zadgadnien Nauk Sadowych 2003;53:38. [Editor's Notes: Reports the results of GC/MS analyses of three separate seizures of illicitly prepared tablets. Contact: Institute of Forensic Research, Cracow, Poland (no further addressing information was provided).]
8. Macchia M, Bertini S, Mori C, Orlando C, Papi C, Placanica G. **Efficient application of monolithic silica column to determination of illicit heroin street sample by HPLC.** Farmaco 2004;59(3):237. [Editor's Notes: Presents the title analysis (complete in 7 minutes). Contact: Department of Pharmaceutical Sciences, University of Pisa, 56126 Pisa, Italy.]
9. Ohyama K, Shirasawa Y, Wada M, Kishikawa N, Ohba Y, Nakashima K, Kuroda N. **Investigation of the novel mixed-mode stationary phase for capillary electrochromatography - I. Preparation and characterization of sulfonated naphthalimido-modified silyl silica gel.** Journal of Chromatography A 2004;1042(1-2):189. [Editor's Notes: Presents the title analysis on a series of barbiturates and benzodiazepines (drugs and matrices not specified in the abstract). Contact: Nagasaki Univ, Course Pharmaceut Sci, Grad Sch Biomed Sci, Analyt Chem, 1-14 Bunkyo Machi, Nagasaki 8528521, Japan.]
10. Roesner P. **Mass spectra of designer drugs.** Wiley: 2003. [Editor's Notes: This is a CD compilation. The abstract indicates 1,400 compounds and 1,700 mass spectra, and claims to be current with all designer drugs encountered up to February, 2003. Contact: No contact information was provided.]
11. Song SM, Marriott P, Kotsos A, Drummer OH, Wynne P. **Comprehensive two-dimensional gas chromatography with time-of-flight mass spectrometry (GC x GC-TOFMS) for drug screening and confirmation.** Forensic Science International 2004;143(2-3):87. [Editor's Notes: 78 drugs of interest were analyzed; some forensic samples were also analyzed satisfactorily. Contact: Department of Applied Chemistry, Australian Centre for Research on Separation Science, Building 3, Bowen St., 124 Latrobe St., Rmit University, GPO Box 2476 V, Melbourne 3001, Australia.]

#### **Additional Reference of Possible Interest:**

1. Ghosh P, Reddy MM, Rao BS, Sarin RK. **Determination of diazepam in cream biscuits by liquid chromatography.** JAOAC International 2004;87(3):569. [Editor's Notes: Presents the title analysis, for detection of criminal adulteration. Contact: Directorate of Forensic Science, Central Forensic Science Laboratory, Ministry of Home Affairs, Hyderabad 500 013, India.]

\* \* \* \* \*

## THE JOURNAL/TEXTBOOK COLLECTION EXCHANGE

The following reference text (occasionally useful for identifying obscure seizure locations) is offered:

*National Geographic Atlas of the World*, 6th Edition; National Geographic Society: Washington, DC, 1990.

Libraries have precedence over individual subscribers in requesting items. In this case, postage will be covered by the DEA Office of Forensic Sciences.

There were no other offerings of journals or textbooks made over the past quarter.

**Subscribers are encouraged to donate surplus or unwanted items or collections; if interested, please consult the *Microgram* website or contact the *Microgram* Editor for further instructions.**

The next offering of journals and textbooks will be in the January 2005 issue of *Microgram Bulletin*.

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## THE DEA FY - 2005 STATE AND LOCAL FORENSIC CHEMISTS SEMINAR SCHEDULE

The remaining FY - 2005 schedule for the DEA's State and Local Forensic Chemists Seminar is as follows:

February 7 - 11, 2005  
May 9 - 13, 2005  
July 11 - 15, 2005  
September 19 - 23, 2005

Note that the school is open only to forensic chemists working for law enforcement agencies, and is intended for chemists who have completed their agency's internal training program and have also been working on the bench for at least one year. There is no tuition charge for this course. The course is held at the AmeriSuites Hotel in Sterling, Virginia (near the Washington/Dulles International Airport). A copy of the application form is reproduced on the last page of the August 2004 issue of *Microgram Bulletin*. Completed applications should be mailed to the Special Testing and Research Laboratory (Attention: Pam Smith or Jennifer Kerlavage) at: 22624 Dulles Summit Court, Dulles, VA 20166. For additional information, call 703/668-3337.

\* \* \* \* \*

## SCIENTIFIC MEETINGS

### 1. Title: AAFS 57th Annual Meeting

(Third Posting)

**Sponsoring Organization:** American Academy of Forensic Sciences

**Inclusive Dates:** February 21 - 26, 2005

**Location:** New Orleans, LA

**Contact Information:** See Website

**Website:** [www.aafs.org](http://www.aafs.org)

## EMPLOYMENT OPPORTUNITIES

### 1. University of Massachusetts Medical School

(Third and Final Posting)

**Position:** Laboratory Analyst II (Two Positions)

**Location:** Worcester, Massachusetts

**Salary Range:** \$32,032 - \$39,915, Commensurate with Experience

**Application Deadline:** Open Until Filled

**Duties:** Performs analytical analysis of evidence for identification and/or quantitation, records information. Performs and documents routine maintenance of equipment. Develops new assays and evaluates new equipment. Trains new personnel. Provides testimony in court when necessary. Advises and aides DAL Evidence Officer on identification, classification, and handling of evidence.

**Qualifications:** B.S. in Chemistry or equivalent (requires strong emphasis on Chemistry) plus 3 years relevant experience or Master's Degree in Chemistry Forensic Science or equivalent and two years of relevant experience. Strong oral and written communicative skills necessary for interaction with other medical center staff as well as outside agencies.

**Application Procedures:** Apply on-line at: [www.umassmed.edu](http://www.umassmed.edu). Search keyword: 04-1360. Or mail/fax a resume to: University of Massachusetts Medical School, Human Resources, 419 Belmont Street, Worcester MA 01604; fax 508-856-2390.

\* \* \* \* \*

### 2. Dupage County Crime Laboratory

(Third and Final Posting)

**Position:** Forensic Scientist II (Drug Chemistry)

**Location:** Wheaton, Illinois

**Salary Range:** \$37,700 - \$56,500

**Application Deadline:** Open Until Filled

**Duties:** Under immediate supervision, performs work in the examination, analysis and evaluation of physical evidence and unknown substances. Performs microscopical, chemical, chromatographic, and spectrophotometric analysis of unknown substances. Writes reports detailing the results of analysis and testifies as an expert witness in judicial proceedings. This is not an exhaustive list of responsibilities and other associated tasks may be expected.

**Qualifications:** Must have a bachelor's degree and two years full time drug analysis experience. It is preferred that the applicant has court-testimony experience (been accepted as an expert witness in the drug chemistry discipline). Trainees will not be considered for this position. Hired applicant will be required to successfully complete a competency test prior to assuming independent casework.

**Application Procedures:** If you meet the minimum qualifications and want to be considered for this position, please mail or email a resume or CV to:

Director John Collins  
Crime Laboratory Director  
DuPage County Sheriff's Office Crime Laboratory  
501 N. County Farm Road  
Wheaton, IL 60187  
jcollins -at- dupageco.org

Additional Information: Please contact Supervisor Carina Thomas at (630) 407-2096, or cthomas -at- dupageco.org

Equal Opportunity Employer

\* \* \* \* \*

# Computer Corner

## Digital Evidence - Origin of Species

# #187

by Michael J. Phelan  
DEA Digital Evidence  
Laboratory

Over the past ten years, the Computer Forensics community has generated a variety of examination specializations. Examples include the traditional sub-disciplines of computer, digital audio, and digital video forensics, as well as newer sub-disciplines such as computer server, network intrusion, and embedded technologies forensics. These emerging specializations demonstrate that the Computer Forensics discipline is differentiating to accommodate the rapid changes in information technologies. However, both the traditional and the new sub-disciplines share a common technical and procedural foundation, and function properly and effectively using standard best practices. This commonality of origin, and use of standardized best practices, is important to digital evidence laboratory managers, academia, and consumers (investigators, prosecutors, and courts), because it defines the essence of the digital evidence discipline. Understanding the nature of digital evidence helps explain the past and, to a certain extent, helps define the future.

### A Biological Model

In the classic view, Computer Forensics derived from the forensic, legal, law enforcement, and information technology communities. These are valid, legitimate perspectives on digital

evidence. However, a more complete understanding of the nature of digital evidence can be better accomplished by stepping outside these communities and looking at the field from a non-traditional perspective. Two widely known theories from biology that are applicable to Computer Forensics are the concepts of evolutionary adaptation and parallel evolution. Evolution adaptation is the continual process of differentiation from a common origin in response to external stimuli. Parallel evolution is a developmental process that results in the simultaneous development or specialization at two or more unrelated locations in reaction to the same set of stimuli. Both of these models are useful in cataloging the varied and on-going dynamics in the digital evidence field.

### Evolutionary Adaptation

There are many examples of evolution adaptation in Computer Forensics. For example, the legal and forensic communities have adapted their cornerstone “best practices” to accommodate digital evidence, without incident. The legal community has effectively and seamlessly applied traditional rules of evidence concepts, such as original, duplicate, and best evidence, to adapt to the digital evidence world. Additionally, the broader constitutional

concepts of search and seizure, and privacy, have not resulted in an inordinate amount of negative case law. Digital evidence, in the most fundamental sense, is just another form of evidence that must be tested, authenticated, and accepted by the judicial process.

Similarly, the forensic science community has successfully adapted digital evidence into its forensic accreditation practices. The American Society of Crime Laboratory Directors/Laboratory Accreditation Board (ASCLD/LAB) now recognizes and accredits digital evidence laboratories. The adaptation of their basic crime laboratory standards to digital evidence laboratories has successfully resulted in several organizations becoming accredited. The success of the legal and forensic communities in adapting to digital evidence examination is in large part due to the mutual agreement on the underlying principals and common origin(s). This common ancestry is based in a structural-procedural approach to information that is accurate, replicable, and non-reputable. In the Federal legal realm, this process is known as the Federal Rules of Evidence. In the forensic community, the same procedural process is known as the scientific method.

### **Parallel Evolution**

There are also several examples of parallel evolution in Computer Forensics. For example, the concept of information assurance has simultaneously evolved in information technology and in digital evidence – because both disciplines are highly concerned with information integrity. Information Assurance was first defined in the 1996 Department of Defense’s S-3600 directive as “information operations that protect and defend information and information systems by ensuring their availability, integrity, authentication, confidentiality, and non-repudiation. This includes providing for the restoration of information systems by incorporating protection, detection, and reaction capabilities.”

Another example is the crime laboratory accreditation process. The ASCLD/LAB standards and the International Standards Organization’s standards for “testing and calibration laboratories” (ISO 17025) have evolved in parallel. ASCLD/LAB originated with the specific intent to professionalize and standardize domestic crime laboratory operations with best practices, whereas ISO originated with the broader intent of establishing international best practices for a wider range of technical testing and calibration laboratories. In essence, crime laboratories are just another type of testing laboratory. Presently, ASCLD/LAB and ISO standards have merged under the new accreditation designation of

ASCLD/LAB-International, and domestic crime laboratories now can meet the combined sets of standards for accreditation. All DEA laboratories, including its Digital Evidence Laboratory, underwent an ASCLD/LAB-International review in September 2004, using a combination of approximately 300 ASCLD/LAB and ISO standards.

A third example of parallel evolution is the origination of digital evidence best practices among several different professional-technical organizations. There are several widely published digital evidence examination best practices documents. Some of the better known sources are: 1) the International Association of Computer Investigative Specialists (IACIS); 2) the Scientific Working Group on Digital Evidence (SWGDE); 3) the International Organization of Computer Evidence (IOCE); and 4) the National Institute of Justice’s Best Practices Guide. These guidelines have a commonality of opinion concerning evidence preservation and authentication, despite differing group membership and initial authorship spanning almost a decade of time. Some of the more striking similarities are: 1) almost universal agreement that examinations should be conducted on a copy whenever possible; 2) digital evidence should be authenticated prior to examination; and 3) original or best evidence should not be changed.

### **The Origin of Species**

Digital evidence shares a common evolutionary history with many established fields such as information technology, forensics, law enforcement, and legal. It is important for managers, trainers, academics, and practitioners to recognize and understand this commonality of origin. The true nature of the digital evidence business is based in the more abstract idea that the end goal of the digital evidence examination process is “information accuracy”, and that the means to that goal is a non-reputable process. This is important, because narrowly focusing on only one functional aspect of the digital evidence business (e.g., information technology, forensics, law enforcement, or legal) will likely result in unbalanced understanding of the nature of digital evidence. This knowledge is important both for understanding the past and for managing the future.

Questions or comments?  
Email: Michael.J.Phelan -at- usdoj.gov





# Microgram

## *Bulletin*

**Published by:**

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Office of Forensic Sciences  
Washington, DC 20537**

**The U.S. Attorney General has determined that the publication of this periodical is necessary in the transaction of the public business required by the Department of Justice. Information, instructions, and disclaimers are published in the January issues.**

**VOL. XXXVII, NO. 11**

**NOVEMBER 2004**

**- INTELLIGENCE ALERT -**

**2,5-DIMETHOXY-4-ETHYLPHENETHYLAMINE (2C-E) ENCOUNTERED  
IN FT. PIERCE, FLORIDA AND ROYAL OAK, MICHIGAN**

The Indian River Crime Laboratory (Ft. Pierce, Florida) recently received three unmarked (and visually unremarkable) clear gelatin capsules, each containing a coarse white powder (total net mass 0.36 grams), alleged to be either 4-bromo-2,5-dimethoxyphenethylamine (also known as "2C-B" or "Nexus") or 2,5-dimethoxy-4-(n)-propylphenethylamine (also known as "2C-T-7" or "Blue Mystic"). The exhibits were submitted by the St. Lucie County Sheriff's Department in Ft. Pierce (circumstances sensitive; Ft. Pierce is located on the south-central Florida east coast, approximately midway between Cape Canaveral and West Palm Beach). Analysis by color testing, UV, and GC/MS, and comparison against a standard provided by the Toxicology Department, Landeskriminalamt Kiel, Germany indicated not 4-bromo-2,5-dimethoxyphenethylamine or 2,5-dimethoxy-4-(n)-propylphenethylamine but rather 2,5-dimethoxy-4-ethylphenethylamine (also known as "2C-E") (not quantitated, salt form not determined).

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The Michigan State Police Forensic Laboratory (Sterling Heights, Michigan) recently received a brown glass vial containing an unknown white powder (total net mass of powder 1.28 grams), suspected cocaine. The exhibit was seized by the Royal Oak Police Department from an

individual who was sent to a local hospital for an overdose, possibly from the unknown powder (Royal Oak is a northern suburb of Detroit). Analysis by GC/MS, however, indicated not cocaine but rather a compound tentatively identified as 2,5-dimethoxy-4-ethylphenethylamine (2C-E) (not quantitated, salt form not determined). The identification was tentative because no standard was available for comparison. This was the first submission of this compound to the Sterling Heights laboratory; however, other submissions have since been made to other Michigan Forensic Laboratories.

[Editor's Notes: 2C-E is one of the designer phenethylamines reported in Alexander Shulgin's book "PIHKAL". According to the Indian River Crime Laboratory analyst, based on discussions with experts around the United States, these appear to be the first appearances of 2C-E in domestic casework. The mass spectrum of 2C-E is reproduced in Figure 1, below.]

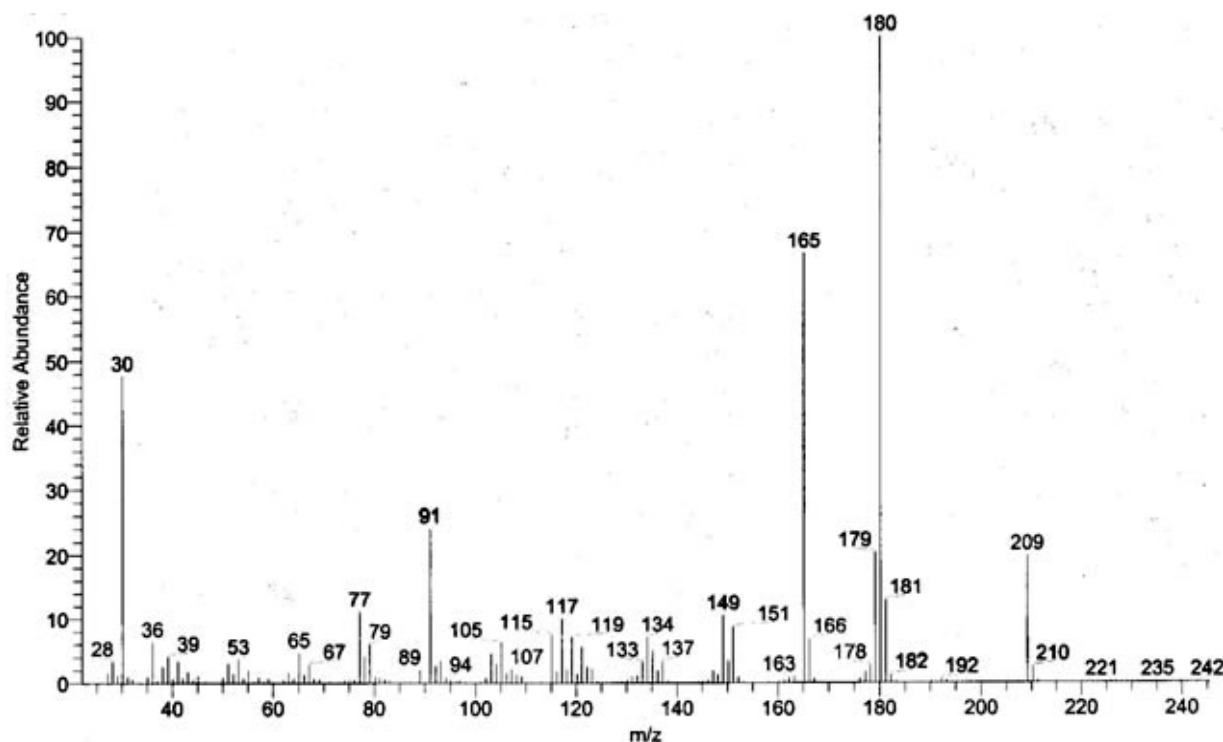


Figure 1 - Mass Spectrum of 2,5-Dimethoxy-4-ethylphenethylamine.

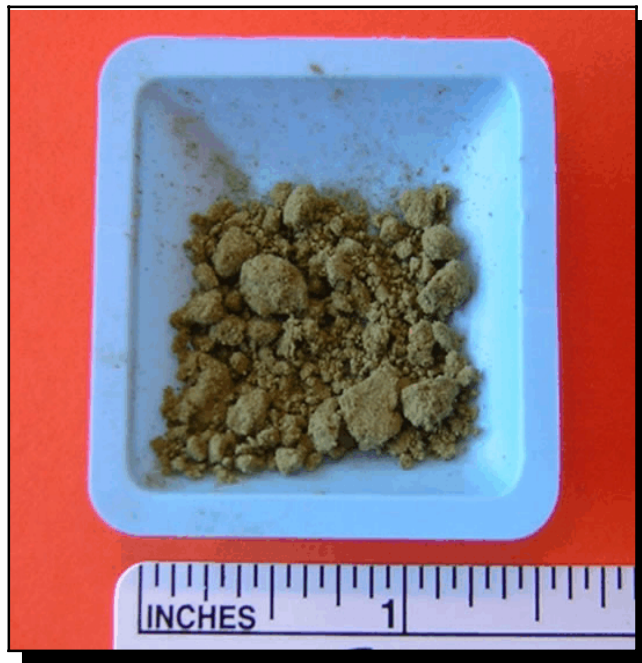
\* \* \* \* \*

### - INTELLIGENCE ALERT -

#### UNIQUE FORMULATION OF HASHISH IN JUNCTION CITY, KANSAS

The DEA Mid-Atlantic Laboratory (Largo, Maryland) recently received a polydrug submission consisting of 21 kilograms of cocaine, 149 kilograms of marijuana, and 55.6 grams of a dry, very fine ground, brown powder packaged in a plastic bag, suspected marijuana residue or hashish

(see a small aliquot in Photo 1). The exhibits were originally seized by DEA Agents in Junction City, Kansas and were submitted to the laboratory after a controlled delivery in Newport News, Virginia. The most intriguing characteristics of the powder were its dryness and fineness. Microscopic examination revealed no plant morphology. Analysis by TLC, Duquenois-Levine, and GC/MS confirmed that the sample contained predominantly  $\Delta^9$ -tetrahydrocannabinol (THC), with traces of cannabinol and cannabidiol. Quantitation was not performed; however, the TLC (with spraying by Fast Blue BB after development) and the Duquenois-Levine test resulted in extremely bright and vivid colors. Hashish is seldom encountered at the laboratory, and this formulation is thought to have been unique.



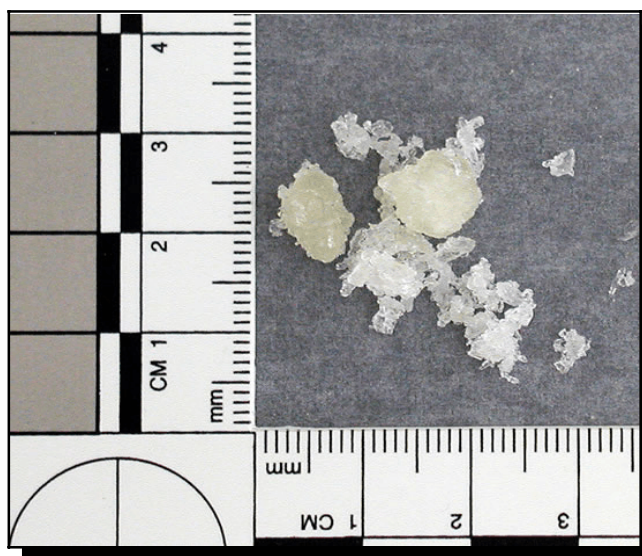
**Photo 1**

\* \* \* \* \*

**- INTELLIGENCE ALERT -**

**DIMETHYLAMPHETAMINE IN APPARENT “ICE” FORM  
NEAR MEDFORD, OREGON**

The DEA Western Laboratory (San Francisco, California) recently received a submission consisting of two clear plastic bags containing a crystalline substance (total net mass 1,355 grams), suspected "Ice" methamphetamine (see Photo 2). The exhibit was seized from a defendant's vehicle (during an arrest) near Medford, Oregon by Agents from the DEA Medford Resident Office. Analysis of the substance by GC/MS, GC-IRD, polarimetry, and TPC derivatization, however, indicated not d-methamphetamine hydrochloride > 80 percent (that is, "Ice"), but rather a mixture of dimethyl sulfone, d-methamphetamine (salt undetermined, present at less than 1 percent), and d-N,N-dimethylamphetamine (salt undetermined). The dimethylamphetamine was not quantitated, but was the major component. The laboratory previously encountered exhibits of dimethylamphetamine in



**Photo 2**

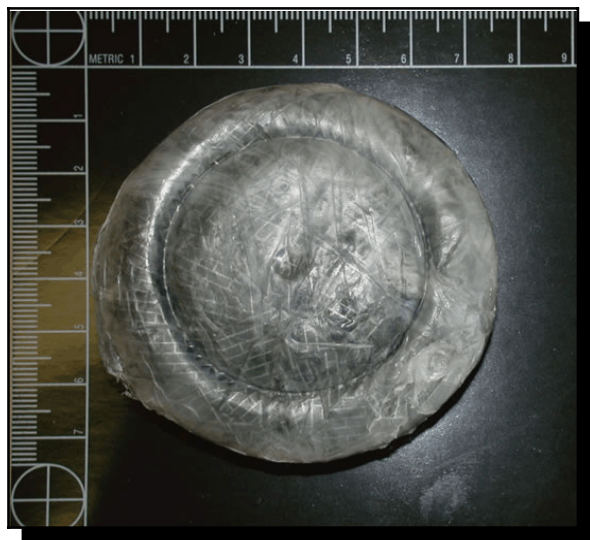
apparent “Ice”-like form, from seizures made in Honolulu in 1994 (but none since then). Subsequent to this latest seizure, another seizure of dimethylamphetamine/dimethyl sulfone/methamphetamine was made in Sacramento, California; however, that exhibit was a clumpy, white powder.

\* \* \* \* \*

### **- INTELLIGENCE ALERT -**

#### **UNUSUALLY PACKAGED DISKS OF COCAINE IN MIAMI, FLORIDA**

The DEA North Central Laboratory (Chicago, Illinois) recently received twelve circular packages each containing a circular disk of a compressed white powder, suspected cocaine. The exhibits were initially seized at the Customs and Border Protection Foreign Mail Unit in Miami, Florida and were submitted to the laboratory after a controlled delivery by the Bureau of Immigration and Customs Enforcement in the Chicago area (the original source of the packages was not reported). Each package was approximately 7.5 cm in diameter and approximately 3 cm at its thickest dimension. The packaging for each circular disk consisted of a knotted plastic bag wrapped in carbon paper which was further wrapped with parafilm (see Photos 3 and 4). Analysis of the powder (total net mass 844.2 grams) by FTIR and GC/MS confirmed 61 percent cocaine hydrochloride, with associated cocaine alkaloids and undetermined methanol and chloroform insolubles. This is the laboratory’s first encounter with disks of cocaine.



**Photo 3**



**Photo 4**

\* \* \* \* \*

**- INTELLIGENCE ALERT -**

**INCREASE IN REPORTING OF MARIJUANA DERIVATIVES**

[From the NDIC *Narcotics Digest Weekly* 2004;3(41):1  
Unclassified, Reprinted with Permission.]

Law enforcement reporting indicates an increase in the availability of marijuana derivatives such as cannabis resin and hashish. For example, in August 2004 local law enforcement in Pembroke Pines, Florida, reported the availability of resin "balls" (small, approximately one-quarter-inch pieces of resin that had been scraped from cannabis plant buds). When field tested, the resin balls indicated a very high THC (delta-9-tetrahydrocannabinol) content. The potential for increased availability of marijuana derivatives exists in any area of the United States because they can be relatively simple to produce. Normally, a fine resin powder is created by separating the resinous bulbs (known as trichomes or crystals) from buds or leaves of cannabis plants. Usually this is accomplished by sieving methods, cold-water extraction, or chemical extraction. The resulting resin powder is commonly called kif (also spelled kef, kief, or keef).

Essentially, kif is hashish before it is pressed. Kif is sprinkled on tobacco or marijuana and smoked as a cigarette or joint and sometimes is inserted in gelatin capsules for oral consumption. Hashish is made by pressing the kif, either by hand or hydraulically, into balls, slabs, or other shapes; it can be light brown to black in color, and the texture ranges from soft and pliable to very hard. Use typically involves smoking pieces of hashish in a pipe or joint, inhaling the vapors emitted from hashish placed on a knife that is heated, and eating foods cooked or baked with hashish (usually first cooked in butter because hashish, as well as marijuana, is fat soluble). Hashish is considered to produce a very strong high. Its potency, as with marijuana, varies widely and has ranged from less than 1 to more than 50 percent; the average THC content of hashish samples tested by the Potency Monitoring Project between May and August 2004 was 6.38 percent.

NDIC Comment: The increased popularity of and demand for higher potency marijuana in the United States likely will result in some increase in the availability of marijuana derivatives, as marijuana users seeking a strong high experiment with products like hashish, and producers and distributors seeking higher profits learn to maximize the earning potential of their cannabis plants. Because bud-type marijuana (sinsemilla) is now in great demand in the United States, there are high profits to be made from harvesting and selling only the buds, while the rest of the plant could be considered trash. Yet some amount of resin also is found on the less potent leaves, and this can be collected to produce hashish that ultimately has a much higher potency than the leaves themselves and therefore a marketable value--a so-called trash-to-stash transformation. Instructions for hash production are readily accessible on the Internet and in print media, and the introduction of equipment such as water hashmaking kits has facilitated home production. Some dealers collect resin off the buds, sell the kif, and also deceitfully sell the now less potent bud. Such fraudulent dealing could lead to sporadic incidents of retribution and violence against the dealers.

Law enforcement reporting on the use of marijuana derivatives in the United States has often

been limited to areas known to be significant markets for higher potency marijuana such as California and south Florida (such as in the incident above), although it could occur anywhere in the United States. For instance, in late July 2004 investigators with the Pennsylvania State Police in south central Pennsylvania purchased a bag of kif, which at that time had never been seen in the area.

\* \* \* \* \*

**- INTELLIGENCE ALERT -**

**COMMINGLED SHIPMENT OF CANADA-PRODUCED MARIJUANA AND MDMA  
SEIZED IN BIRCH BAY, WASHINGTON**

[From the NDIC *Narcotics Digest Weekly* 2004;3(42):2  
Unclassified, Reprinted with Permission.]

Officials from ICE and U.S. Coast Guard Investigative Services (CGIS) report seizing 213 pounds of Canada-produced marijuana as well as 444 tablets of MDMA that were concealed in one of the seized packages of marijuana. On June 2, 2004, ICE and CGIS agents seized the 213 pounds of marijuana and arrested three individuals--two Canadian citizens and one U.S. citizen--on charges of smuggling marijuana from British Colombia, Canada, to the United States. Agents allege that the Canadian suspects used a kayak to transport the marijuana via Semiahmoo Bay to Birch Bay, Washington, where they docked the kayak behind a house located on the bay. The suspects then carried the kayak with the marijuana concealed inside into the house, where they repackaged the marijuana. Agents observed the suspects carrying six boxes from the house to a pickup truck that was parked by the front door and was owned by the third suspect. Agents obtained consent to search the truck and found vacuum-sealed packages of marijuana labeled with letters "A" through "K" in the boxes. The packages contained either one resealable plastic bag covered in vacuum-sealed bags or what appeared to be two resealable plastic bags vacuum-sealed together. On September 27, 2004, ICE agents reweighed the marijuana to determine the appropriate sentence under federal sentencing guidelines. When ICE agents opened the package labeled "E," they discovered a resealable plastic bag containing 444 tablets of MDMA located between two resealable plastic bags containing marijuana. Until the vacuum packaging was removed, the marijuana had obscured the MDMA from view. Agents opened the rest of the packages, but no drugs other than marijuana were found.

NDIC Comment: This seizure is significant because, according to the CGIS, this is the first discovery of contraband concealed within contraband in the Blaine area. While significant amounts of Canadian-produced marijuana have been smuggled through and between ports of entry (POEs) located near Blaine for years, more MDMA is now being smuggled through the area. According to the U.S. Bureau of Customs and Border Protection (CBP), the number of MDMA tablets seized at the Blaine POE has increased from 33,813 in 2002 to 41,132 in 2003. Thus far, 108,358 tablets have been seized between January 1, 2004, and July 19, 2004. Powdered MDMA also is being seized at the Blaine POE. According to CBP, a total of 84.00 kilograms of powdered MDMA was seized in 2002, a total of 1.84 kilograms in 2003, and a total of 9.77 kilograms between January 1, 2004, and July 19, 2004.



**- INTELLIGENCE BRIEF -**

**VIETNAMESE GROUP'S SOPHISTICATED CANNABIS GROW FOUND  
IN UPSCALE NEIGHBORHOOD IN SOUTHTON  
AND BURLINGTON, CONNECTICUT**

[From the NDIC *Narcotics Digest Weekly* 2004;3(40):2  
Unclassified, Reprinted with Permission;  
Some Details Withheld in Accordance with *Microgram* Policy.]

On September 15, 2004, officers with the Southington Police Department and the Connecticut State Police Statewide Narcotics Task Force arrested five members of a Vietnamese criminal group for operating three indoor cannabis grows in central Connecticut. Officers discovered the first cannabis grow after being called to a house in an upscale neighborhood of Southington for a report of a disturbance and smoke coming from the structure. Upon their arrival, a 47-year-old Vietnamese man holding two cannabis plants approached the officers, apparently unaware that they were law enforcement officers. The man indicated to officers that he had been assaulted by another man inside the home. Officers detained the man and then examined the inside of the house, where they discovered a 52-year-old Vietnamese man as well as a third man who attempted to flee out the back of the home. Officers also found 992 cannabis plants inside the house, which was valued at over \$400,000. The grow operation had a sophisticated lighting and irrigation system encompassing the basement and upper floor of the house. The only furniture in the home were two mattresses. An illegal tap into the city's underground electrical supply bypassed the home's electrical meter. Officers believe that the hookup was accomplished while the wires were hot, indicating that sophisticated electrical skills would have been needed. Officers determined that a small electrical fire had caused the smoke that alerted neighbors who called the police. While officers secured the scene, a Vietnamese female drove up in a private vehicle with Florida license plates and attempted to enter the house. The woman consented to a search of her vehicle, which revealed receipts for equipment from Canada that is typically used in cannabis cultivation. Officers obtained and executed a search warrant for her residence, also in Southington, where they found another indoor cannabis grow as well as two Vietnamese men, aged 25 and 52, who were loading 83 cannabis plants into a commercial truck. A search warrant was obtained for the men's Burlington residence, where a third grow and an additional 225 cannabis plants were seized. The five individuals were arrested and charged with possession of marijuana over 1 kilogram with intent to sell, conspiracy in operating a drug factory, conspiracy to possess marijuana, and cultivation of marijuana. Two of the men also were charged with disorderly conduct, threatening, and assault. DEA provided additional manpower and assistance during the investigation.

NDIC Comment: Law enforcement reporting indicates that Vietnamese criminal groups are establishing sophisticated indoor cannabis cultivation sites in the New England region. A similar incident occurred in West Haven in May 2004 when DEA agents seized 600 cannabis plants from the basement of a three-story building. The building was occupied by members of a Vietnamese criminal group, and evidence suggested that members of the group had planned to expand their operation to other floors in the building. This group also illegally bypassed an

electrical meter. Seized Canadian currency and deposit slips indicated a large number of small deposits to a bank in Vancouver (BC) Canada.

Some of these cultivation sites likely are connected to Vietnamese criminal groups operating in Canada. Canadian law enforcement agencies report that Vietnamese criminal groups operating sophisticated indoor cannabis grows are common, particularly in urban areas within the provinces of Ontario and British Columbia. Many times these groups will purchase or lease large (over 2,000 square feet) homes that cost \$200,000 to \$500,000 in Canadian currency. The groups reportedly maintain renovation crews that make structural changes to the home--installing heating and venting systems and bypassing electrical meters. Sometimes the groups look for homes that are under construction to allow workmen to make the modifications more easily. After setting up a grow inside the home, recent immigrants often are paid to live in the house to avoid suspicion.

\* \* \* \* \*

## SELECTED REFERENCES

[Notes: Selected references are a compilation of recent publications of presumed interest to forensic chemists. Unless otherwise stated, all listed citations are published in English. If available, the email address for the primary author is provided as the contact information. Listed mailing address information (which is sometimes cryptic or incomplete) exactly duplicates that provided by the abstracting services. In addition, in order to prevent automated theft of email addresses off the Internet postings of *Microgram Bulletin*, unless otherwise requested by the corresponding author, all email addresses reported in the *Bulletin* have had the “@” character replaced by “-at-”; this will need to be converted back (by hand) before the address can be used.]

1. Blachut D, Danikiewicz W, Olejnik M, Czarnocki Z. **Electron ionization mass spectrometry as a tool for the investigation of the ortho effect in fragmentation of some Schiff bases derived from amphetamine analogs.** Journal of Mass Spectrometry 2004;39(8):966. [Editor's Notes: Presents and discusses the fragmentation patterns of Schiff bases derived from 2-, 3-, and 4-methoxyamphetamine. Contact: Faculty of Chemistry, Warsaw University, Warsaw 02-093, Pol.]
2. Carpentier C, Griffiths P, King LA. **An overview of cannabis potency in Europe.** Report EMCDDA Insights 2004;1. [Editor's Notes: Presents the title study, and discusses the results versus the comparable data for the United States and Australia/New Zealand. Contact: 27 Ivar Gardens, Basingstoke, Hampshire, RG24 8YD, UK.]
3. Gartsev NA, Semeikin NP, Sharshin YA, Pomozov VV, Nedorezov AV, Nikiforov AA. **Detector for detection of explosives and drugs.** RU 2234695 C1 20 Aug 2004. CLASS: ICM: G01N024-00. APPLICATION: RU 2003-106186 6 Mar 2003. [Editor's Notes: Appears to be based on nuclear quadrupole resonance detection. Drugs not specified. This patent is written in Russian. Contact: Russia (no further addressing information was provided).]
4. Hida M, Mitsui T, Tsuge S, Ohtani H. **Rapid and sensitive determination of morphine in street opium samples by thermal desorption gas chromatography using a microfurnacepyrolyzer.** Journal of Separation Science 2004;27(12):1030. [Editor's Notes:

Presents the title analysis. Contact: Criminal Investigation Lab., Aichi Prefectural Police HDQS, Nagoya, Aichi 460-8502, Japan.]

5. Hida M, Satoh M, Mitsui T. **Detection of trace methamphetamine in dimethylamphetamine hydrochloride as stimulant material.** Bunseki Kagaku 2004;53(8):847. [Editor's Notes: A study to determine whether trace methamphetamine in a dimethylamphetamine sample is an artifact or an actual impurity. This article is written in Japanese. Contact: Criminal Investigation Lab., Aichi Prefectural Police HDQS, Nagoya, Aichi 460-8502, Japan.]
6. Koelliker S, Oehme M. **Structure elucidation of nanogram quantities of unknown designer drugs based on phenylalkylamine derivates by ion trap multiple mass spectrometry.** Analytical and Bioanalytical Chemistry 2004;378(5):1294. [Editor's Notes: Presents the use of HPLC-multiple mass spectrometry on 55 phenylalkylamines (focus is on compounds in European ecstasy tablets). Contact: Organic Analytical Chemistry, University of Basel, 4057 Basel, Switz.]
7. Poklis A. **Propoxyphene: Still popular after five decades of use.** Clinical and Forensic Toxicology News 2004;5. [Editor's Notes: An overview of the title compound. Contact: Dept. of Chemistry and Forensic Science, Virginia Commonwealth University, Richmond, VA (zip code not provided).]
8. Puetz M, Huhn C, Dahlenburg R, Pyell U. **Determination of beta-carboline alkaloids and tryptamines in Ayahuasca and plant drugs using MEKC-UV-LIF.** GTFCh - Symposium: Ausgewahlte Aspekte der Forensischen Toxikologie, Beitrage zum Symposium der Gesellschaft fuer Toxikologische und Forensische Chemie, 13th, Mosbach, Germany, Apr. 3-5, 2003 2003:275. [Editor's Notes: Presents the title analysis. Also includes analysis of methanolic extracts of Banisteriopsis caapi and Peganum harmala. Contact: Fachbereich KT 34 (Toxikologie), Bundeskriminalamt, D-65173 Wiesbaden, Germany.]
9. Zoppi U, Skopec Z, Skopec J, Jones G, Fink D, Hua Q, Jacobsen G, Tuniz C, Williams A. **Forensic applications of C-14 bomb-pulse dating.** Nuclear Instruments & Methods in Physics Research, Section B: Beam Interactions with Materials and Atoms 2004:223. [Editor's Notes: A minor review of the title technique. Includes the application to establishing the time of harvest of heroin and opium, and discusses the potential of the technique for profiling illicit drugs deriving from natural sources. Contact: ANSTO - Environment, PMB 1, Menai NSW 2234, Australia.]

#### **Additional Reference of Possible Interest:**

1. Kalasinsky KS, Hugel J, Kish SJ. **Use of MDA (the "Love Drug") and methamphetamine in Toronto by unsuspecting users of ecstasy.** Journal of Forensic Sciences 2004;49(5):1106. [Editor's Notes: An overview of the use of alleged MDMA tablets containing mixed and/or alternative drugs; focus is biological/toxicological. Contact: stephen\_kish -at- camh.net .]
2. Meier AW, Liu RH. **Forensic applications of isotope ratio mass spectrometry.** Advances in Forensic Applications of Mass Spectrometry 2004:149 (Chapter 4). [Editor's Notes: An overview and review. Appears to focus on biological/toxicological forensic applications (not clear in the abstract). This is a CRC Press text. Contact: No contact information was provided in the abstract.]

3. Shao X, Wang G, Wang S, Su Q. **Extraction of mass spectra and chromatographic profiles from overlapping GC/MS signals with background.** *Analytical Chemistry* 2004;76(17):5143. [Editor's Notes: Presents the title study. The authors indicate that the presented methodology is better than the SIMPLISMA technique. Contact: xshao -at- ustc.edu.cn .]

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## THE DEA FY - 2005 STATE AND LOCAL FORENSIC CHEMISTS SEMINAR SCHEDULE

The remaining FY - 2005 schedule for the DEA's State and Local Forensic Chemists Seminar is as follows:

February 7 - 11, 2005  
May 9 - 13, 2005  
July 11 - 15, 2005  
September 19 - 23, 2005

Note that the school is open only to forensic chemists working for law enforcement agencies, and is intended for chemists who have completed their agency's internal training program and have also been working on the bench for at least one year. There is no tuition charge for this course. The course is held at the AmeriSuites Hotel in Sterling, Virginia (near the Washington/Dulles International Airport). A copy of the application form is reproduced on the last page of the August 2004 issue of *Microgram Bulletin*. Completed applications should be mailed to the Special Testing and Research Laboratory (Attention: Pam Smith or Jennifer Kerlavage) at: 22624 Dulles Summit Court, Dulles, VA 20166. For additional information, call 703/668-3337.

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## SCIENTIFIC MEETINGS

### 1. Title: AAFS 57th Annual Meeting

(Fourth Posting)

**Sponsoring Organization:** American Academy of Forensic Sciences

**Inclusive Dates:** February 21 - 26, 2005

**Location:** New Orleans, LA

**Contact Information:** See Website

**Website:** [www.aafs.org](http://www.aafs.org)

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# Computer Corner

## Digital Evidence Storage - Audit Concepts

# #188

by Michael J. Phelan  
DEA Digital Evidence  
Laboratory

All digital evidence laboratories must operate a secure storage system that maintains the chain of custody for every piece of evidence. Small and/or part-time digital evidence operations may keep their evidence in a locked room or safe. Typically, there is minimal paperwork or external oversight for such programs. Larger operations may receive and handle evidence by adhering to the existing evidence handling policies and procedures of their parent department or crime laboratory. These latter, larger programs usually have a series of steps (and people) to receive, package, and check out evidence. Redundant evidence tracking systems (often a manual and electronic tracking system operating in parallel) are not uncommon in such organizations. Currently, a few law enforcement organizations operate dedicated digital evidence-only storage areas or vaults. These usually conform to the existing general evidence policies and procedures of the parent organization. However, there may be some unique functions in a digital evidence vault, such as a data archive that contains hard drive backups and/or copies of completed examination findings. Other digital evidence “vaults” may actually be entirely electronic, consisting of a Storage Area Network (SAN) computer

system that holds copies of unanalyzed and analyzed evidence. Regardless of the specific system in use, however, it is almost always an organization requirement - and an excellent “best practice” - that the entire contents of the evidence storage area or vault be periodically audited to verify the vault’s contents and ensure the integrity of the chain of custody records.

### Audit Scope

Digital evidence audit policies should: 1) define the objectives of the audit process; 2) enumerate the procedures required to conduct an audit; and 3) list the circumstances that trigger an audit. In addition, there must be policies to report any deficiencies uncovered through an audit, and to document their remediation.

### Evidence Audit Purpose

Audits of digital evidence secure storage should, at a minimum, ensure that all evidence is accounted for. Additionally, supporting examination or backup examination material must also be accounted for. Examples include all archive evidence (if any exists), supporting case folders, and manual and automated supporting evidence transaction information. The scope of the audit can be expanded to include reviews of evidence storage

security documentation such as alarm logs, key or proximity card accountability, door and lock box combination access, and manual and/or automated evidence record keeping system security.

A digital evidence audit should be conducted by personnel familiar with the operation, but the auditors should not have had any immediate operational responsibility for the evidence storage functions. The audit team must be (or become) familiar with the current organizational policies and procedures. Verification of the evidence handling and storage policies and procedures, prior to commencement of the audit, should be made with both the Laboratory Director and the Quality Assurance Manager. Smaller organizations may have to use an evidence custodian as an assistant if independent qualified personnel do not exist. However, it is critical that the senior official or team leader of the audit not be an evidence custodian or anyone else who has had unsupervised access to the vault during the period that the audit covers.

### Audit Timing and Need

Generally, evidence audits should be conducted at least annually or anytime that the personnel who have access to the evidence storage area changes.

This includes adding a new member with access, or the removal, reassignment, or retirement of any individual who had access.

### **Primary Audit Goals**

Audits of digital evidence vaults should use multiple comparisons to verify that the contents are present and/or properly accounted for. Some classical audit checks include: 1) comparison of the manual and automated evidence storage and evidence check-out records; 2) verification that the evidence objects are present in the vault, in the custody of the court, or in the possession of an examiner; 3) comparison of the evidence information in the examiner's case file with the evidence vault records; and 4) comparison of the evidence information within the case folder's forms or work sheets with the examiner's handwritten or typed examination notes.

### **Secondary Audit Goals**

Secondary audit objectives may include: 1) a review of evidence destruction and examination folder retention records; 2) a review of internal monthly or quarterly evidence quality control checks; 3) verification that the evidence custodian has successfully completed a qualification test and participated in all required in-service training requirements; and 4) interviews of the digital evidence practitioners or laboratory staff, and assessment of their level of familiarity with the organization's evidence handling policies.

### **Tertiary Audit Goals**

Tertiary audit objectives may include a review of the practitioner's compliance with maintaining chains of custody. This could include a lunch-time or after-hours inspection of the work areas for unsecured evidence or case folders (i.e., is the evidence secured in accordance with the organization's written policies?) It is also useful to determine if non-laboratory personnel can access the work and evidence storage areas. Are cleaning crews, maintenance personnel, or security officials allowed unsupervised access? If access must be supervised (as specified in the organization's policy manual), is supervision actually being performed?

The audit team leader should provide a written report at the conclusion of the audit. The audit report should document audit actions taken, significant findings, and provide corrective action recommendations.

### **Conclusion**

The failure to maintain proper chains of custody, or the misplacement, loss, or improper destruction of evidence, are all very serious and unacceptable errors. The regular use of aggressive audits provides assurance that any problems are detected early, and corrected. Effective evidence audits should consist of multiple and independent verifications. Audits may consist of complete inspections, or use a sampling technique. The former is preferred because of the serious consequences of any significant problem(s) for a law enforcement organization.

Private sector digital forensic laboratories should adhere to the same standards as law enforcement organizations, since corporate reputations and follow-on government prosecutions are both inextricably tied to a solid chain of custody and proper evidence handling.

Questions or comments?

Email: Michael.J.Phelan -at- usdoj.gov





# Microgram

## *Bulletin*

**Published by:**

**The Drug Enforcement Administration  
Office of Forensic Sciences  
Washington, DC 20537**

**The U.S. Attorney General has determined that the publication of this periodical is necessary in the transaction of the public business required by the Department of Justice. Information, instructions, and disclaimers are published in the January issues.**

**VOL. XXXVII, NO. 12**

**DECEMBER 2004**

**- INTELLIGENCE ALERT -**

**PHENYLPROPYLMETHYLAMINE IN BROWARD COUNTY, FLORIDA**

The DEA Southeast Laboratory (Miami, Florida) recently received a small amount of yellow powder, submitted as an unknown, suspected designer drug (see Photo 1). The exhibit was submitted by the Broward County Sheriff's Office Crime Laboratory, and was taken from a 633 gram seizure previously submitted to that laboratory (details of seizure not provided). The powder did not give a color change with either the Scott's test or Mecke reagent; however, a slow orange color developed with the Marquis reagent, and a deep blue color was observed with sodium nitroprusside. Analysis by GC/MS on both a chloroform extract (from a basified solution) and the TPC derivative, and by FTIR and NMR, indicated racemic phenylpropylmethylamine (PPMA) hydrochloride (quantitation not performed).

This is believed to be the first ever submission of PPMA HCl to the Southeast Laboratory.



**Photo 1**

[Editor's Notes: PPMA is the "mistake" product from the use of an incorrect precursor in illicit "prop-dope" methamphetamine laboratories (that is, 2-phenylpropanal instead of phenyl-2-propanone), and has been occasionally reported to *Microgram* since 1982. It has minimal (if any) CNS stimulant activity, and is not controlled. A comprehensive analytical profile of PPMA was published in *Microgram* 1998;31(10):269. Note that all issues of *Microgram* prior to January 2003 are law enforcement restricted.]

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**- INTELLIGENCE ALERT -**

**QUILTED UNISEX GARMENTS CONTAINING HEROIN  
IN NEW YORK, NEW YORK**

The DEA Northeast Laboratory (New York, New York) recently received a submission of 19 unisex garments containing quilted liners underneath the upper body area, containing an off-white powder within the quilted pockets, suspected heroin (see Photos 2 and 3). The garments were seized in the New York City area by agents from the DEA New York Division (details of seizure not available). Analysis of the powder (total net mass 3701.7 grams) by GC/FID, GC/MS, and FTIR confirmed an average of 75 percent heroin hydrochloride. Three of the quilted liners contained only heroin, while the other sixteen contained a mixture of heroin, acetaminophen, caffeine, and lidocaine. The origin of the garments was not determined; however, similar clothing items have originated primarily in Central and South America (but also from the Middle East). The Northeast Laboratory has previously received a variety of similarly quilted clothing containing controlled substances within the quilted pockets.



**Photo 2**



**Photo 3**

\* \* \* \* \*

**- INTELLIGENCE ALERT -**

**OPIUM IN ROLLS OF WALLPAPER IN TARZANA, CALIFORNIA**

The DEA Southwest Laboratory (Vista, California) recently received two rolls of wallpaper, each with a compartment inside (created by “thinning” the core tube) that was used to conceal a dark brown substance (total net mass 1152 grams), suspected opium. The exhibits were seized by Immigration and Customs Enforcement personnel at an express mail facility in Memphis, Tennessee and were submitted to the laboratory after an attempted controlled delivery in Tarzana, California. Each roll was approximately two feet long and three inches in diameter. A thin outer layer of wallpaper was wrapped around the substance, which was packaged in clear plastic and molded around the thinned plastic core (see Photos 4 - 5). Analysis by ATR-IR and GC, and GC/MS indicated codeine, morphine, thebaine, and papaverine, confirming opium (quantitations not performed). The origin of the rolls was reported only as “overseas”. This was the first such submission of this type smuggling technique to the Southwest Laboratory.



**Photo 5**



**Photo 6**

**- INTELLIGENCE ALERT -**

**CREATINE IN ECSTASY TABLETS IN OKLAHOMA CITY, OKLAHOMA**

The DEA South Central Laboratory (Dallas, Texas) recently received 50 bluish-purple tablets with a "\$" logo on one side and half-score on the other side, weighing 262 milligrams each, suspected MDMA (see Photo 6; note that the color in the photo is not true). The tablets were acquired in Oklahoma City as a result of an undercover purchase by agents from the DEA Oklahoma City Division. Analysis by GC, GC/MS, FTIR, and HPLC confirmed 55 milligrams of 3,4-methylenedioxymethamphetamine hydrochloride per tablet, along with 49 milligrams of creatine per tablet (creatine is a health food supplement). This is believed to be the first submission of MDMA tablets containing creatine to the South Central Laboratory.



**Photo 6**

[Editor's Notes: The analytical profile for creatine has been presented in two recent articles in *Microgram*: 2000;33(8):223 and 2001;34(2):33. Note that all issues of *Microgram* prior to January 2003 are law enforcement restricted.]

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**- INTELLIGENCE ALERT -**

**2C-B LABORATORY SEIZED IN TIOGA COUNTY, NEW YORK**

[From the NDIC *Narcotics Digest Weekly* 2004;3(46):3  
Unclassified, Reprinted with Permission;  
Some Details Withheld in Accordance with *Microgram* Policy.]

On October 17, 2004, New York State Police (NYSP) seized a clandestine 2C-B laboratory after responding to a disturbance at a private residence in the rural community of Lockwood. According to NYSP officers, a male in his early twenties allegedly obtained precursor chemicals via the Internet and manufactured 2C-B in the laboratory he operated from the basement of his residence. NYSP suspects that he also was distributing 2C-B. The Tioga County Hazardous Materials Team, NYSP Community Narcotics Enforcement Team of the Southern Tier, and Lockwood Fire Department remediated the laboratory.

NDIC Comment: 2C-B (4-bromo-2,5-dimethoxyphenethylamine, also known as Nexus) is a synthetic hallucinogen that is produced in clandestine laboratories. Producers of synthetic hallucinogens such as 2C-B usually act independently and often purchase precursor chemicals using the Internet. 2C-B laboratories have been seized in Arizona, California, South Dakota, Canada, and Europe. 2C-B has been a Schedule I controlled substance under the Controlled



Substances Act since 1994; however, DEA reports first encountering 2C-B in 1979. 2C-B powder, capsules, and tablets have been seized at locations throughout the United States, particularly at venues in which club drugs such as MDMA (3,4-methylenedioxy-methamphetamine, also known as ecstasy) are available and abused.

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**- INTELLIGENCE BRIEF -**

**DEA AVIATION DIVISION AND DEA YAKIMA RESIDENT OFFICE  
SEIZE SOPHISTICATED MARIJUANA GROWS  
IN KLINKITAT COUNTY, WASHINGTON**

In late August, the Aviation Division's Cannabis Eradication Response Team (CERT), in conjunction with the Yakima Resident Office and state and local law enforcement, seized approximately 65,000 marijuana plants with an estimated street value of nearly \$35 million. The marijuana grows were located on the Yakima Nation Indian Reservation in Klickitat County, Washington (see Photo 7). Each grow had an irrigation system sophisticated enough to provide water for individual plants. Additionally, each plot had a camp which housed someone who tended the plants. No one was present at either grow site at the time of the seizures; however, two arrests were made shortly thereafter.



**Photo 7**

\* \* \* \* \*

**- INTELLIGENCE BRIEF -**

**LARGEST CANNABIS GROW SITE IN SOUTHERN UTAH HISTORY SEIZED**

[From the NDIC *Narcotics Digest Weekly* 2004;3(45):4  
Unclassified, Reprinted with Permission;  
Some Details Withheld in Accordance with *Microgram* Policy.]

On October 8, 2004, Washington County Drug Task Force agents in southern Utah seized the largest cannabis grow site in that area's history and arrested three Mexican national males at the site and a fourth the next day near St. George. The site was located along a stream in a secluded area near the Pine Valley district of the Dixie National Forest, and included over 1,500 cannabis plants. Task force agents subsequently seized 814 cannabis plants growing among scrub oak

trees, 764 plants in the drying stage, and 50 pounds of processed marijuana. Cultivators used a gravity-flow irrigation system that allowed water from a nearby stream to flow through plastic tubing to the grow site. Law enforcement authorities believe that several other accomplices may have left the area for southern California or Mexico. Agencies participating in the investigation include Bureau of Land Management rangers, DEA, Ivins Department of Public Safety, St. George Police Department, USDA Forest Service, Utah Department of Public Safety, Washington County Search and Rescue, and the Washington County Sheriff's Office.

NDIC Comment: Mexican DTOs frequently choose remote areas of National Forest Service land to cultivate cannabis and often employ undocumented aliens from Mexico to live onsite and tend these plots. Three of the men arrested during this investigation were Mexican nationals who stated that they had come to the area from California specifically to tend and harvest the cannabis plants. The marijuana was processed at the cultivation site and distributed in California.

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## **- INTELLIGENCE BRIEF -**

### **ANABOLIC STEROID CONTROL ACT OF 2004**

[Information from the DEA Office of Diversion  
Drug and Chemical Evaluation Section  
Unclassified]

On October 22, 2004 the President signed into law the Anabolic Steroid Control Act of 2004, Public Law 108-358. This law amends the Controlled Substances Act to change the definition of "anabolic steroid" and to add 36 steroids to the list of specifically controlled steroids. The new provision became effective January 20, 2005 and brought to 59 the total number of steroids controlled.

This law amends 21 U.S.C. \* 802 (41), which defines the term "anabolic steroid". This amendment removes the phrase "that promotes muscle growth" from the definition. This means that in a prosecution for trafficking in a substance which the Government maintains is an anabolic steroid, the Government does not have to prove that the substance promotes muscle growth.

The law also adds 36 specific substances to the list of substances which are anabolic steroids. This list includes the substance 4-androstenedione, also known as "Andro".

This law also controls the esters of the listed steroids and the salts of those esters. However, it removed from automatic control the isomers of listed steroids.

In addition, the new law directs the United States Sentencing Commission to review the Federal Sentencing Guidelines with respect to offenses involving anabolic steroids and consider amending the guidelines to provide increased penalties.



Section 812, Schedule III (E) of the Controlled Substances Act specifically provides that those substances defined as anabolic steroids are Schedule III Controlled Substances.

These new provisions became effective on January 20, 2005.

Questions concerning the law may be directed to Attorney Charlotte Mapes at 703/632-5342. Specific questions concerning anabolic steroids may be directed to the Drug and Chemical Evaluation Section at 202/307-7183.

\* \* \* \* \*

## SELECTED REFERENCES

[Notes: Selected references are a compilation of recent publications of presumed interest to forensic chemists. Unless otherwise stated, all listed citations are published in English. If available, the email address for the primary author is provided as the contact information. Listed mailing address information (which is sometimes cryptic or incomplete) exactly duplicates that provided by the abstracting services. In addition, in order to prevent automated theft of email addresses off the Internet postings of *Microgram Bulletin*, unless otherwise requested by the corresponding author, all email addresses reported in the *Bulletin* have had the “@” character replaced by “-at-”; this will need to be converted back (by hand) before the address can be used.]

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## THE DEA FY - 2005 STATE AND LOCAL FORENSIC CHEMISTS SEMINAR SCHEDULE

The remaining FY - 2005 schedule for the DEA's State and Local Forensic Chemists Seminar is as follows:

February 7 - 11, 2005  
May 9 - 13, 2005  
July 11 - 15, 2005  
September 19 - 23, 2005

Note that the school is open only to forensic chemists working for law enforcement agencies, and is intended for chemists who have completed their agency's internal training program and have also been working on the bench for at least one year. There is no tuition charge for this course. The course is held at the AmeriSuites Hotel in Sterling, Virginia (near the Washington/Dulles International Airport). A copy of the application form is reproduced on the last page of the August 2004 issue of *Microgram Bulletin*. Completed applications should be mailed to the Special Testing and Research Laboratory (Attention: Pam Smith or Jennifer Kerlavage) at: 22624 Dulles Summit Court, Dulles, VA 20166. For additional information, call 703/668-3337.

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## SCIENTIFIC MEETINGS

**1. Title: AAFS 57th Annual Meeting**

(Fifth and Final Posting)

**Sponsoring Organization:** American Academy of Forensic Sciences

**Inclusive Dates:** February 21 - 26, 2005

**Location:** New Orleans, LA

**Contact Information:** See Website

**Website:** [www.aafs.org](http://www.aafs.org)

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# Computer Corner

## Evidentiary Perspectives

# #189

by Michael J. Phelan  
DEA Digital Evidence  
Laboratory

The goal of all law enforcement forensic programs is to gather accurate and complete findings, and ultimately to have those findings presented in court. Legal rules of admissibility impact all investigative and forensic practices that involve evidence collection, labeling, handling, examination, and reporting. Digital Evidence is no exception. However, there are two distinct evidentiary digital evidence concepts – “Business Records” and “Best Evidence” – with which digital evidence examiners must be familiar. Digital evidence expert witnesses may be required by a court to explain the nature, handling, and examination of the evidence from either point of view.

### Business Records

The first perspective involves the court’s acceptance of digital evidence as “business records” that fall within the business records exemption in the Federal Rules of Evidence 803(6). This rule defines a business record as: “a memorandum, report, record, or data compilation, in any form, of acts, events, conditions, opinions, or diagnoses, made at or near the time by, or from information transmitted by, a person with knowledge, if kept in the course of a regularly conducted business activity, and if it was the regular practice of that business activity to make the

memorandum, report, record, or data compilation, all as shown by the testimony of the custodian, or other qualified witness, or by certification that complies with Rule 902(11), Rule 902(12), or a statute permitting certification, unless the source of the information or method or circumstances of preparation indicate lack of trustworthiness”.

An examiner must address some key legal concerns when introducing digital evidence as “business records”. The principal concern is the trustworthiness of the records. Technical issues that may require clarification include the security (read/write access rights) surrounding the file structures or databases that store data, the software program that manipulates the raw data, and the algorithms that aggregate and present summary data.

Examples of computer-generated “business records” include stored e-mail folders, financial transactional data, computer communication and operating system logs, inventory data, and sales records. Business records are most often recovered in financial fraud and money laundering investigations. Drug diversion cases, pharmacy, chemical company, and even doctor-patient records can fall within the meaning of business

records. These types of records may be voluminous and can contribute to documenting “intent” by the frequency and preponderance of certain records or transactions.

### Original Evidence

Federal Rule of Evidence 1001(1) has a broad definition of original evidence, which defines “writings and recordings” to include magnetic, mechanical, or electronic methods of “setting down letters, words, numbers, or their equivalent.” Clearly, computer data that is either stored or transmitted meets this definition.

Most digital evidence investigations involve seized or surrendered original evidence objects such as computers and their hard drives, storage media (diskettes, CDs, or DVDs), cell phones, or Personal Digital Assistants (PDAs). However, it is not considered to be a best practice to directly examine the original object(s) because of the potential of changing or erasing data contained on said object(s). On occasion, exigent circumstances or technical limitations may require processing the original evidence, but a large majority of the evidentiary digital evidence objects can be duplicated, and the duplicate examined for potential probative information. The use of a duplicate thereby

eliminates the risk that data on the original evidence will be destroyed or changed.

### **Duplicate Evidence**

Federal Rule of Evidence 1003 provides that a “duplicate is admissible to the same extent as an original unless (1) a genuine question is raised as to the authenticity of the original, or (2) in the circumstances it would be unfair to admit the duplicate in lieu of the original.”

A duplicate is defined in Federal Rule of Evidence 1001(4) as: “a counterpart produced by the same impression as the original ... by mechanical or electronic re-recording ... or by other equivalent techniques which accurately reproduces the original.”

Thus, hard drives, diskettes, tapes, memory sticks, and digital data stored in memory in devices such as cell phones, pagers, and cameras, all meet the definition of original evidence, and forensically produced copies meet the definition of duplicate evidence.

### **Best Evidence**

The second perspective involves the court’s acceptance of digital evidence as the “best evidence” (which can be either the original or duplicate data). Federal Rule of Evidence 1001(3) states: “If data are stored in a computer or similar device, any printout or other output readable by sight, shown to reflect the data accurately, is an ‘original’.”

Examples of digital “best evidence” include individual e-mail messages, Internet chat

transcripts, server logs, or personal pictures, sound files, writings (documents), an entire hard drive (consisting of a sector-by-sector copy), a hard drive partition, or a file directory. The best evidence concept is frequently used in investigations involving digital evidence when the original evidence cannot be seized based upon technical limitations or legal restrictions in the search warrant or consent to search. In such instances, an on-site copy is made in a forensically acceptable manner, and processed in the laboratory at some later date. Approximately 30% of all DEA digital evidence is acquired on-site as best evidence. Typically, this type of evidence collection is needed for seizures at commercial businesses, where suspect records are commingled with licit files, or in circumstances where physical removal of the computer (or central server) would cause undue hardship on a business (such as payroll, sales, or intra-office communication), or endanger patients by making their records at a pharmacy or doctor’s office unavailable. The growing use of distributed network storage techniques, and ever larger storage capacities on personal computers, will likely result in a continuously increasing need by law enforcement to acquire data on-site, and selectively. A complete copy of an entire hard drive is too time consuming to make in many circumstances, and also would probably exceed the ability of an investigator to review it all in a timely fashion.

### **Digital Evidence**

### **Authentication**

Digital evidence presented as best evidence must also be able to be authenticated. Such authentication can take many forms, but the general Federal Rule of Evidence (Rule 901(b)(4)) interpretation involves the establishment of evidence that is “distinctive” in its “appearance, contents, substance, internal patterns or other distinctive characteristics, taken in conjunction with circumstances.” Possible digital evidence authentication methods include date/time stamp file information, software registry information, digital signatures, computer time line analyses, physical computer access, witness first-hand accounts, file access privileges, file password protection, and (most importantly) file content.

Forensically accepted procedures that are grounded in the scientific method promote a conclusion of trustworthiness. Some standard forensic best practices that are used in digital evidence laboratories include: 1) use of validated examination techniques and software; 2) use of positive and negative examination controls; 3) routine checking of examination instrumentation for potential hardware or software problems; 4) conducting quality assurance checks involving peer reviews, technical reviews, and administrative reviews; 5) providing for examiner qualification and regular proficiency testing; and 6) use of binary mathematical techniques (such as the MD-5 or SHA-1 hash algorithms) that support that a copy is the same as its



original with a stated measure of uncertainty.

The basis of these techniques is outlined in the 1993 Supreme Court ruling in *Daubert v. Merrell Dow Pharmaceuticals*, in which the criteria required to admit expert scientific testimony in a federal trial was clarified. The Supreme Court ruled that a judge should consider: 1) Whether the theory or technique in question can be (or has been) tested; 2) Whether it has been subjected to peer review and publication; 3) Whether the technique has a potential error rate; 4) Whether there are standards controlling the operation; and 5) Whether there is widespread acceptance of the theory or technique within the relevant scientific community.

Several organizations have already published general best practice guidelines or inspection criteria for Digital Evidence programs, including the Scientific Working Group on Digital Evidence ([swgde.org](http://swgde.org)), the International Association of Computer Investigation Specialists ([iacis.org](http://iacis.org)), and the American Scientific Crime Laboratory Directors Laboratory Accreditation Board ([ascld-lab.org](http://ascld-lab.org)). Best practices has also been a continuous theme over the past 68 issues of this Column.

#### **Chain of Custody**

Finally, the collection, handling, and storage of digital evidence, irrespective of whether the evidence consists of business records or best evidence, must have a clear chain of custody.

This is especially important in digital evidence forensics because of the fungible (easily changed) nature of the evidence (for example, file date and time stamp information is changed by opening or copying a file, temporary file data may be destroyed by simply rebooting the operating system, and file fragments can be over-written by storing data). Evidence admissibility includes a hand-to-hand chain of accountability, particularly when the evidence is either fungible or non-distinctive (that is, lacking unique identification information). Digital evidence is often non-distinctive. For example, many generic computers do not have serial numbers on their outside cases, and storage media rarely has a unique identification. This lack of unique identifiers can only be compensated for with a continuous chain of custody, good evidence labeling, and secure packaging (i.e., using tamper resistant seals or security tape).

#### **Conclusion**

The introduction of computer evidence in court must meet generally acceptable measures of reliability. Digital evidence forensic examiners must ensure that the evidence can be authenticated, and that there is a clear chain of custody while the evidence is in their custody. Digital Evidence expert witnesses must be able to communicate how the evidence was collected, labeled, handled, examined, and reported. In the final view, evidence is evidence, and the rules regarding evidence are as applicable to digital objects as they are to other forms

of evidence. If there is any unusual aspect to digital evidence, it is the fact that it can be complex to understand (but so is DNA), and that it can be duplicated (but so can latent fingerprint data be copied). Such distinctions are not significant, and basic evidence collection, handling, and examination methods still apply, and should be practiced.

Questions or comments?

Email: [Michael.J.Phelan -at- usdoj.gov](mailto:Michael.J.Phelan-at-usdoj.gov)

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# Microgram

## *Bulletin*

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**- JANUARY 2006 -**

**- INTELLIGENCE ALERT -**

### **HOMEMADE ALCOHOLIC MARIJUANA-BASED TOPICAL SOLUTIONS IN CHICAGO, ILLINOIS**

The Illinois State Police Forensic Science Center at Chicago (Chicago, Illinois) recently received eighteen bottles, commercially labeled as “Isopropyl Rubbing Alcohol” and “Wintergreen with Methyl Salicylate” isopropyl rubbing alcohol, each containing plant material suspended in a green liquid, suspected to be marijuana in the original alcoholic solutions (see Photo 1). The exhibits were seized by the Chicago Police Department pursuant to a search warrant (circumstances unknown). Each bottle contained approximately 400 grams of combined material (total net mass in all 18 bottles 7122.5 grams). Microscopic



**Photo 1**

[Note: Labels Intentionally Blurred.]

analysis of the isolated and dried plant material confirmed marijuana morphology; however, the Duquenois-Levine test was inconclusive, probably due to the material's prolonged submersion in the alcoholic solutions (resulting in comprehensive extraction of the cannabinoids). Analysis of a concentrated sample of the liquid by GC/MS confirmed  $\Delta^9$ -tetrahydrocannabinol (THC; not quantitated). This was the first submission of this type to the laboratory. According to the suspect, the exhibits were a homemade topical mixture intended to relieve arthritis pain.

\* \* \* \* \*

**- INTELLIGENCE ALERT -**

**OXYCONTIN MIMIC TABLETS (CONTAINING FENTANYL)  
NEAR ATLANTIC, IOWA**

The Douglas County Sheriff's Department Laboratory (Omaha, Nebraska), recently received eleven apparent Oxycontin tablets from the Cass County Sheriff's Department in Atlantic, Iowa (see Photos 2 and 3). The tablets were part of a polydrug and currency seizure made pursuant to a vehicle stop on westbound I-80 near Atlantic (about 40 miles east of Omaha, Nebraska). The tablets (total net mass 1.56 grams) were light green and approximated the physical dimensions, weight, and logo of 80 milligram Oxycontin (oxycodone) tablets. Analysis by GC/MS, however, indicated not oxycodone but rather fentanyl (not quantitated). This is the first ever submission of fentanyl-containing Oxycontin mimic tablets to the laboratory.



**Photo 2**



**Photo 3**

[Editor's Notes: The other items seized from the vehicle included dietary supplement tablets, "personal use" quantities of methamphetamine, oxycodone tablets, and hydrocodone tablets, and \$370,000 in U.S. currency. Intelligence indicated that the vehicle was traveling from Minneapolis, Minnesota to San Francisco, California, and that the driver was a currency smuggling courier. Additional intelligence enabled the San Francisco Police to obtain a search warrant for the suspect's residence, where they seized additional methamphetamine, additional controlled pharmaceuticals, and marijuana cultivation equipment. A seizure of similar fentanyl-containing Oxycontin mimic tablets was recently made by the New York Police Department (no further details available).]

**- INTELLIGENCE ALERT -**

**FRESH KHAT IN PORTLAND, OREGON**

The Oregon State Police Portland Metro Forensic Laboratory (Clackamas, Oregon) recently received two exhibits containing a total of 90 bundles of fresh green leaves and stem bundles, suspected khat (see Photo 4). Each bundle was wrapped in a large leaf and husk-like strips; unraveled bundles each showed three sub-bundles of stems/leaves (see Photo 5). The exhibits were seized by the Portland Police Bureau (circumstances unknown). Because of the possibility of cathinone degradation over time, the evidence was frozen until analyzed. Analysis of extracts of the plant material (total net mass 7.31 kilograms) by GC and GC/MS confirmed cathinone, cathine, and phenylpropanolamine (not quantitated). This was the second submission of khat to the Oregon State Police Laboratory System.



**Photo 4**



**Photo 5**

\* \* \* \* \*

**- INTELLIGENCE ALERT -**

**2C-I CAPSULES IN MIAMI BEACH, FLORIDA**

The Miami-Dade Police Department Crime Laboratory (Miami, Florida) recently received six capsules, each containing a small amount of white crystalline material, suspected methamphetamine (see Photo 6 (scale is in inches)). The exhibits were seized in the Miami Beach South Patrol District by the Miami Beach Police pursuant to an arrest for a hit-and-run traffic accident. Analysis of the powder (total net mass approximately 60 milligrams) by color tests gave a dark green color with the Marquis reagent and a negative result with sodium nitroprusside (both inconsistent for



**Photo 6**



methamphetamine). Further analysis by GC/MS and FT-IR/ATR indicated not methamphetamine but rather 2,5-dimethoxy-4-iodophenethylamine (commonly known as 2C-I; not quantitated). This was the first ever submission of 2C-I to the laboratory.

[Editor's Notes: 2C-I is more commonly encountered in Ecstasy mimic tablets with an "i" logo (to date, mostly seen in western Europe). For a photo of one such "i" logo tablet, see: "2C-I - A New Amphetamine Type Stimulant Identified in Denmark." Microgram Bulletin 2003;36(5):89.]

\* \* \* \* \*

### **- INTELLIGENCE ALERT -**

### **MDMA MIMIC TABLETS (CONTAINING METHAMPHETAMINE AND PHENCYCLIDINE (PCP)) IN CHICAGO, ILLINOIS**

The Cook County Sheriff's Police Department Forensic Laboratory (Maywood, Illinois) recently received two partial tablets with different colors and logos, suspected MDMA (see Photo 7). The tablets were seized by the Cook County Sheriff's Police Department's Narcotics Unit from two European nationals in northwest Chicago (no further details available). One tablet (9 x 4 millimeters) was off-white with a "Mitsubishi" logo, while the other (8 x 3 millimeters) was pink with an "@" logo. Analysis by GC/MS, however, indicated not MDMA but rather a mixture of methamphetamine and phencyclidine (PCP). The controlled substances were not quantitated; however, the approximate ratios were 14:1 and 28:1 methamphetamine to phencyclidine, respectively, based on their Total Ion Chromatograms. This was the first ever submission of Ecstasy mimic tablets containing this particular mixture to the laboratory.



**Photo 7**

[Editor's Notes: A submission of 882 similar (methamphetamine/phencyclidine/"Mitsubishi" logo) tablets was recently analyzed by the DEA North Central Laboratory (Chicago, Illinois). These tablets were also seized in the Chicago area (further details not available). Ecstasy mimic tablets containing mixtures of methamphetamine and *ketamine* are (thus far) more common than those containing methamphetamine and phencyclidine (PCP).]

\* \* \* \* \*

**- INTELLIGENCE ALERT -**

**COCAINE IN AN EYE SHADOW CONTAINER IN BUENOS AIRES, ARGENTINA**

The DEA Special Testing and Research Laboratory (Dulles, Virginia) recently received an eye shadow container that contained a plastic baggie containing a white powder, suspected cocaine (see Photo 8 (scale is in inches)). The exhibit was selected from a much larger seizure made from the luggage of a Portuguese National at the Ezeiza Airport in Buenos Aires, Argentina (who was en route to Madrid, Spain). Analysis of the powder (total net mass 7.6 grams) by GC, IR, and GC/MS confirmed 91.4 percent cocaine hydrochloride. This is the first submission of this particular concealment method to the Special Testing and Research Laboratory.



**Photo 8**

\* \* \* \* \*

**- INTELLIGENCE ALERT -**

**UNUSUAL HEROIN CONCEALMENT TECHNIQUE IN ALMA, KANSAS**

The DEA North Central Laboratory (Chicago, Illinois) recently received 25 packets, each packaged with plastic wrapping over black electrical tape, suspected cocaine (see Photo 9 (scale is a one foot ruler)). The exhibits were seized by a Kansas Highway Patrol Trooper during a routine traffic stop and subsequent consent search in Alma (located off I-70, about 25 miles west of Topeka). The submission consisted of nine bundles measuring 8 x 4 inches and sixteen bundles measuring 5 x 2.5 inches.



**Photo 9**

Unusually, each bundle was coated with a viscous substance that smelled like camphor/menthol (not further identified). Upon disassembly, each packet contained a brick of compressed tan powder wrapped in multiple layers of tape and cellophane; the nine larger bricks also had impressions of a goat with the word "Capricorn" over the goat impression. Analysis of the



powder (total net mass 12.27 kilograms) by FTIR, GC/MS, and GC, however, indicated not cocaine but rather 89 percent heroin hydrochloride. This is believed to be the first submission of heroin bricks coated with a camphor/menthol odorant to the North Central Laboratory.

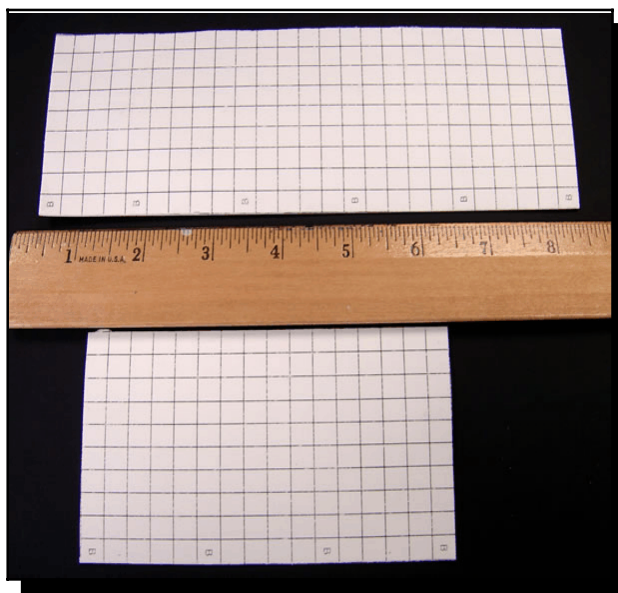
[Editor's Note: It is suspected that the camphor/menthol coating was intended to mask the heroin from canine detection.]

\* \* \* \* \*

#### **- INTELLIGENCE ALERT -**

### **METHANDROSTENOLONE "BLOTTER PAPER" IN SANTA CLARA, CALIFORNIA**

The DEA Western Laboratory (San Francisco, California) recently received two pieces of a cardboard type paper with gridlines marking off 430 squares (each 0.82 x 0.75 centimeters), a suspected steroid (see Photo 10). The exhibits were part of a larger collection of various steroids, and were seized by the Santa Clara Police Department (circumstances not provided). The papers (8.2 x 3. and 5.9 x 3. inches, respectively, total net mass 16.4 grams) did not fluoresce under UV light. Analysis of an alcoholic extract and separately a methylene chloride extract (from saturated sodium bicarbonate) by GC/MS indicated methandrostenolone (not quantitated). This was the first submission of this type to the Western Laboratory.



**Photo 10**

\* \* \* \* \*

#### **- INTELLIGENCE BRIEF -**

### **HEROIN ADULTERATED WITH PHENOBARBITAL IN WASHINGTON, DC**

The DEA Mid-Atlantic Laboratory (Largo, Maryland) recently received 30 small plastic bags containing a fine off-white powder, suspected heroin. The exhibits were seized by the Metropolitan Police Department of Washington, DC (circumstances not provided). Analysis of the powder (total net mass 2.3 grams) by GC/MS, FTIR and GC confirmed 15 percent heroin hydrochloride, adulterated with a small amount (less than 1 percent) phenobarbital, along with caffeine and quinine. Based on DEA laboratory seizure data, this type of mixture (that is, heroin and phenobarbital) has been submitted about 50 times since 1970. Most of the submissions have been from the Mid-Atlantic region, suggesting a possible common source; however, the relative amounts of heroin and phenobarbital in the seizures has varied widely over the years.

## - SAFETY ALERT; FOLLOWUP -

Sir: Concerning the Safety Alert entitled: "Bulk Marijuana in Hazardous Packaging in Chicago, Illinois" published in the November 2005 *Microgram Bulletin*. When I was assigned to the U.S. Army's Technical Escort Unit in 1966, we discovered that the mixing of dry hypochlorite chemicals (pool sanitizing compounds, dry bleach, etc.) with hydrocarbon solvents or other organic chemicals will cause a chemical fire. This fire can be very intense and difficult to extinguish. I saw a similar fire when a liquid soap leaked into a drum of dry bleach at a laundry. All personnel should be aware of the fire hazard from packaging incorporating dry hypochlorite.

John M. Porter  
Manager, Drug Analysis Laboratory  
Prince George's County Police Department  
Landover, Maryland

\* \* \* \* \*

## SELECTED REFERENCES

[Selected references are a compilation of recent publications of presumed interest to forensic chemists. Unless otherwise stated, all listed citations are published in English. Listed mailing address information (which is sometimes cryptic or incomplete) exactly duplicates that provided by the abstracting service. Patents are reported only by their *Chemical Abstracts* citation number.]

1. Anastos N, Barnett NW, Lewis SW, Gathergood N, Scammells PJ, Sims DN. **Determination of psilocin and psilocybin using flow injection analysis with acidic potassium permanganate and tris(2,2'-bipyridyl)ruthenium(II) chemiluminescence detection, respectively.** *Talanta* 2005;67(2):354. [Editor's Notes: Includes a synthesis of psilocin. Contact: School of Biological and Chemical Sciences, Deakin University, Geelong, 3217 Australia.]
2. Evans HK. **History of microcrystal tests in forensic science.** *Microscope* 2005;53(1):3. [Editor's Notes: Presents the title topic. Contact: Sheriff's Department, San Bernardino Co, San Bernardino, CA 92415.]
3. Hopen TJ. **Microchemical tests: Methods and techniques.** *Microscope* 2005;53(1):5. [Editor's Notes: Focus is on organic and inorganic ions. Contact: Firearms and Explosives, Bureau of Alcohol, Tobacco, and Firearms, Atlanta, GA 30345.]
4. Mali BD, Garad MV. **Thin-layer chromatographic detection of chloral hydrate in an alcoholic beverage.** *Journal of Planar Chromatography - Modern TLC* 2005;18(105):397. [Editor's Notes: Reaction with orcinol under alkaline conditions produces a yellow spot. Contact: Regional Forensic Science Laboratory, Aurangabad 431 002, India.]
5. Reddy MM, Krishna JG, Sashidhar RB, Varshney KM, Sarin RK. **Evaluation of fatty acids as biochemical markers for source identification of Indian opium.** *LC-GC Europe* 2005;18(10):541. [Editor's Notes: 124 samples were analyzed. Certain fatty acids were useful as biochemical markers for source determination. Contact: Department of Biochemistry, University College of Science, Osmania University, Hyderabad, India.]

6. Spangenberg B, Seigel A, Kempf J, Weinmann W. **Forensic drug analysis by means of diode-array HPTLC using RF and UV library search.** Journal of Planar Chromatography - Modern TLC 2005;18(105):336. [Editor's Notes: 33 compounds with "benzodiazepine properties" (not further specified in the abstract) were analyzed by the title technique. Contact: University of Applied Sciences Offenburg, Offenburg 77652, Germany.]
7. Yoshimatsu K, Kiuchi F, Shimomura K, Makino Y. **A rapid and reliable solid-phase extraction method for high-performance liquid chromatographic analysis of opium alkaloids from *Papaver* plants.** Chemical and Pharmaceutical Bulletin 2005;53(11):1446. [Editor's Notes: Presents the title technique. Contact: Research Center for Medicinal Plant Resources, National Institute of Biomedical Innovation, 1-2 Hachimandai, Tsukuba, Ibaraki 305-0843, Japan.]

#### Additional References of Possible Interest:

1. Almirall JR, Umpierrez S, Castro W, Gornushkin I, Winefordner J. **Forensic elemental analysis of materials by laser induced breakdown spectroscopy (LIBS).** Proceedings of SPIE - The International Society for Optical Engineering 2005;5778:657. [Editor's Notes: Presents the title technique, on a variety of substrates (illicit drugs were not mentioned). Contact: Florida International Univ. (no further addressing information was provided).]
2. Dolnik V, Liu S. **Applications of capillary electrophoresis on microchips.** Journal of Separation Science 2005;28(15):1994. [Editor's Notes: A review (143 refs.). Contact: Alcor BioSeparations, Santa Clara, CA (zip code not provided).]
3. Rendle DF. **Advances in chemistry applied to forensic science.** Chemical Society Reviews 2005;34(12):1021. [Editor's Notes: A generic overview. Contact: Scientific Consultant, 9 Wiltshire Drive, Wokingham, UK RG40 1TQ.]
4. Verma RS, Dalela AK, Tripathi RM, Middha D. **Designer drugs.** Journal of Forensic Medicine and Toxicology 2005;22(1):8. [Editor's Notes: An overview. Contact: Central Forensic Science Laboratory, D.F.S., M.H.A. Gov't of India, Chandigarh 160036, India.]

\* \* \* \* \*

## THE JOURNAL/TEXTBOOK COLLECTION EXCHANGE

The Journal/Textbook Collection Exchange is a service intended to facilitate the transfer of unwanted or surplus journals and textbooks to forensic libraries or other subscribers. At present, this service is offered once a quarter (in January, April, July, and October). The most current items are listed below. The offers are First Come/First Serve (except libraries have preference). There are no charges to the requestor. Provide full mailing address in request. **Important!:** Do not provide an address that irradiates mail!

\* British Pharmacopoeia, 2003 - Volumes I - IV, plus the Veterinary Volume (this is the complete collection; hard copies).

- \* The *Journal of Forensic Sciences*:  
     2003 - January (#1).  
     2004 - March (#2), July (#4), and November (#6).  
     2005 - Entire year (#'s 1-6), plus January (#1), May (#3), July (#4), and November (#6).
- \* The Merck Index, 11th Edition (this is the "Centennial" Edition).
- \* Physician's Desk Reference, 48th Edition (1994).
- \* The *Wall Street Journal*, 1986 - 1994 (microfilm).
- \* The *Washington Post*, 1978 - 1993 (microfilm, has various gaps).

**All subscribers are encouraged to donate surplus or unwanted items/collections.** Reference texts and long runs of forensic/analytical journals are of particular interest; however, even single issues are worthwhile. If interested, please consult the *Microgram* website or contact the *Microgram* Editor for further instructions.

The next offering of journals and textbooks will be in the April 2006 issue of *Microgram Bulletin*.

\* \* \* \* \*

## THE DEA FY - 2006 STATE AND LOCAL FORENSIC CHEMISTS SEMINAR SCHEDULE

The remaining FY - 2006 schedule for the DEA's State and Local Forensic Chemists Seminar is as follows:

February 6 - 10, 2006  
 May 8 - 12, 2006  
 July 10 - 14, 2006  
 September 11 - 15, 2006

Note that the school is open only to forensic chemists working for law enforcement agencies, and is intended for chemists who have completed their agency's internal training program and have also been working on the bench for at least one year. There is no tuition charge for this course. The course is held at the AmeriSuites Hotel in Sterling, Virginia (near the Washington/Dulles International Airport). A copy of the application form is reproduced on the last page of the August 2004 issue of *Microgram Bulletin*. Completed applications should be mailed to the Special Testing and Research Laboratory (Attention: Pam Smith or Jennifer Kerlavage) at: 22624 Dulles Summit Court, Dulles, VA 20166. For additional information, call 703/668-3337.

\* \* \* \* \*

Digital evidence storage and preservation is a salient concern for law enforcement agencies. The ever-increasing diversity of digital equipment, and its ever-increasing use, present unusual challenges for law enforcement personnel - not only in the collection and processing of digital evidence, but also in its storage and long-term preservation. Regardless of type or form, the purpose of evidence storage and preservation is to keep the evidence intact, unchanged, and safe from damage or destruction, so that it can be used in a court of law. However, digital evidence poses several unique challenges versus more “classic” forms of forensic evidence.

Because digital evidence covers such a broad range of items and types (e.g., computers, cell phones, digital video, digital audio, etc.), this column will focus only on those issues specific to computers and computer related storage media.

The fragile nature of digital evidence in a computer is deceptive in its initial outward appearance, which has it seemingly well protected inside a metallic hard drive case which is in turn inside the metallic computer case. A trained forensic examiner understands this inherent fragility, and therefore ensures that proper forensic methods are used to preserve the evidence. In contrast, an untrained individual may destroy the evidence by merely turning the computer on. Excessive heat, electromagnets, and destructive Trojan horse programs or viruses are only some of the additional hazards that can permanently destroy computer evidence - possibly in seconds.

Digital evidence stored on computer hard drives can be found at three different levels, two of which are not visible to the average computer user, and must be accessed using forensic tools and methods. Again, an untrained individual attempting to access and extract this information, without using the proper tools and methods, would not only miss possibly relevant information, and could also destroy evidence by inadvertently overwriting or deleting it.

Several evidence preservation methods exist that can be used to prevent the inadvertent changing or destruction of digital evidence. These include the use of write blocking technologies and the creation of forensic copies.

Two types of write blocking methods exist: Software and hardware. If utilized correctly, either method effectively preserves the evidence by preventing the user from writing to or otherwise physically accessing and changing the information on the hard drive. The use of these write-blocking methods, combined with the creation of forensic copies, provides a means to preserve and examine the evidence without the threat of change or destruction.

The creation of a forensic copy is a process in which an exact duplicate of the original evidence is produced using specialized forensic software. The copy is usually saved in the form of multiple “image” files, which when combined within the forensic software tool provides the

forensic examiner with a safe environment in which to analyze the contents of the hard drive without the threat of deleterious change. The validity of the copy is verified using a mathematical algorithm known as a “hash” that creates a unique alphanumeric value, which is compared to the original. If the copy is exact, the alphanumeric values are the same.

With respect to the storage of digital evidence, the first question is: “What type of media should be used?”

There are two principal forms of storage media, optical and magnetic. Each provide their own set of unique capabilities and store data in binary form – zeros and ones. Optical media uses a laser to create and read indentations that are burnt into a reflective metallic surface. This method offers a larger storage capacity, increased stability, and a greater lifespan, versus magnetic media. Optical media includes all the various CD and DVD variations. Magnetic media uses a device called a “read/write head” to create and read magnetic impressions on the surface of the media. This method is inherently less stable, because the media itself is not as durable as optical media, and the recorded information slowly fades due to magnetic hysteresis (this unpreventable phenomenon explains why, for example, a music cassette tape from the 1970's sounds terrible if played today, even if it was stored under pristine conditions over the past 30 years). Magnetic media includes all the various variations of hard drives, floppy disks, or other similar type disks, and digital audio tapes.

As implied above, although both media types offer viable storage solutions, magnetic media is more problematic than optical media. While digital audio tapes provide (in some cases) similar storage capacity, information stability, and storage lifespan as its optical counterparts, it may be difficult to access the information after a number of years, both because of data fading (from magnetic hysteresis) and especially if the tape drive used to create it was replaced by a newer model. [In the latter case, the slightly different alignment of the read/write heads is the issue.] Software is another issue that seems to plague digital audio tapes. In most cases, a proprietary software program was used to create the tapes - and if this software is lost or otherwise unavailable, accessing the information will be difficult. In order to ensure that this issue does not present itself, the original tape drive and software must be retained, and kept in good operational condition. In addition, a larger space is needed to store magnetic media, and environmental conditions in that space must be more carefully controlled.

For these reasons, with the recent introduction of effective forensic CD/DVD archive systems, optical media is fast becoming the preferred choice for most law enforcement agencies for long-term storage of digital evidence. These systems are designed to copy files from one form of media to another, usually a hard drive to a CD or DVD. In addition, the CD or DVD can then be read by nearly any CD or DVD reader on the market. This is a major advantage, and eliminates the need to retain the original CD/DVD burner and software. The space required to store this media is significantly less versus magnetic media, and the environmental requirements are less rigorous. If the storage space is properly protected the media should be stable for many years.

Questions or comments? E-mail: [Clayton.D.Schilling -at- usdoj.gov](mailto:Clayton.D.Schilling-usdoj.gov)



## Information and Instructions for *Microgram Bulletin*

[Editor's Preface: The following information and instructions are derived from the *Microgram* website < <http://www.dea.gov/programs/forensicsci/microgram/index.html> >, and are provided here for the convenience of those subscribers who do not have access to the Internet.]

### **General Information**

*Microgram Bulletin* is a monthly newsletter published by the U.S. Drug Enforcement Administration's Office of Forensic Sciences, and is primarily intended to assist and serve forensic scientists concerned with the detection and analyses of suspected controlled substances for forensic/law enforcement purposes.

### **Subscriptions to Microgram Bulletin**

*Microgram Bulletin* is unclassified (as of the January 2003 issues), and is published on the DEA public access website (see the above URL). **Private citizens should use the website to access *Microgram Bulletin*.** Professional scientific and law enforcement personnel may either use the website or request a subscription. Subscriptions are available electronically and in hard copy. Electronic subscriptions require Internet access. The publications themselves will not be sent electronically to any subscriber; rather, an email notification of the pertinent URL will be sent to the subscriber when the respective issue is posted on the website (see additional information on email notifications, below). Requests for hard copies are strongly discouraged, and should be limited to those offices that do not have access to the Internet, require hard copies for their libraries, or have some other valid reason (Note: "For my personal collection" is not considered to be a valid reason). Requests for hard copies should indicate the number of copies required (maximum of two allowed per office), and should also include formal justification. Note that due to publication delays beyond the control of the Office of Forensic Sciences, hard copies will arrive from 30 to 180 days after electronic posting.

Requests to be added to the subscription list should be submitted via email to the *Microgram* Editor at: [microgram\\_editor@mailsnare.net](mailto:microgram_editor@mailsnare.net) If email submission is not possible, requests should be mailed to: *Microgram* Editor, Drug Enforcement Administration, Office of Forensic Sciences, 2401 Jefferson Davis Highway, Alexandria, VA 22301. All requests to be added to the *Microgram* mailing list should include the following **Standard Contact Information**:

- \* The Full Name and Mailing Address of Submitting Laboratory or Office;
- \* The Full Name, Title (Laboratory Director, Assistant Special Agent in Charge, Librarian, etc.), Phone Number, FAX Number, and Preferred email Address of the Submitting Individual (Note that subscriptions are mailed to titles, not names, in order to avoid subscription problems arising from future personnel changes);
- \* If available, the generic email address for the Submitting Laboratory or Office;
- \* If a generic email address is not available, **one** private email address for an individual who is likely to be a long-term employee, who has a stable email address, and who will be responsible for forwarding *Microgram* information to all of the other employees in the requestor's Office (Note that only one email address per Office will be honored);
- \* If requesting hard copy mailings, the number of copies requested (two max), and justification.

Requests to be removed from the *Microgram* subscription list, or to change an existing subscription, should also be sent to the *Microgram* Editor. Such requests should include all of the pertinent standard contact information detailed above, and also should provide the email and/or hard mail address currently being utilized for the requestor's subscription.

Note that, due to mailing delays and/or publication timeframes, subscription requests/changes may take as long as 90 days to implement.

#### **Email Notifications** (Additional Comments)

As noted above, electronic subscriptions are email based. The email provides a notification of the *Microgram* URL when a new issue is posted, and additional information as appropriate. Note that *Microgram* notices will NEVER include any attachments, or any hyperlink other than the *Microgram* URL. This is important, because the [microgram\\_editor@mailsnare.net](mailto:microgram_editor@mailsnare.net) address is routinely hijacked and used to send spam, very commonly including malicious attachments. For this reason, all subscribers are urged to have current Anti-Viral, Anti-Spyware, and Firewall programs in operation.

#### **Costs**

Subscriptions to *Microgram* are free.

#### **Submissions to *Microgram Bulletin***

*Microgram Bulletin* includes Intelligence Alerts, Safety Alerts, Intelligence Briefs, Selected Intelligence Briefs, Selected Literature References, Meeting Announcements, Employment Opportunities, pertinent sections from the Code of Federal Regulations, Columns of topical importance, and similar material of interest to the counter-drug community. Explanatory details for most of the above types of submission are detailed below, and typical examples are provided in most issues of *Microgram Bulletin*.

All submissions must be in English. Because *Microgram Bulletin* is unclassified, **case sensitive information should not be submitted!** All submissions should, whenever possible, be submitted electronically, as straight email or as an IBM® PC-compatible Corel WordPerfect® or Microsoft Word® attachment, to: [microgram\\_editor@mailsnare.net](mailto:microgram_editor@mailsnare.net) Current versions of Corel WordPerfect® or Microsoft Word® (defined as having release dates less than 5 years old) should be utilized. If email submission is not possible, submissions may be mailed to: *Microgram* Editor, Drug Enforcement Administration, Office of Forensic Sciences, 2401 Jefferson Davis Highway, Alexandria, VA 22301. Hard copy mailings should be accompanied by an electronic version on a 3 ½ inch IBM® PC-compatible diskette. **Note that diskettes should be mailed in an irradiation-proof protective sleeve, and the mailing envelope should be marked: "Warning - Contains Electronic Media - Do Not Irradiate"**. Note also that mailed submissions may be subject to lengthy handling delays beyond the control of the Office of Forensic Sciences, and electronic media sent through the mail may be destroyed en route by sanitizing procedures, despite protective measures and written warnings. All submissions should include the following **Contact Information:** The Full Name and Address of Submitting Laboratory or Office, and the Full Name, Phone Number, FAX Number, and Preferred email Address of the Submitting Individual.

**Intelligence Briefs** are concise synopses of the physical and chemical characteristics of novel and/or interesting exhibits submitted to law enforcement laboratories involved in the detection and analyses of suspected controlled substances for forensic/law enforcement purposes. They should include descriptive details adhering to (as appropriate) the following outline:

What laboratory did the analysis? (Full Name)  
Where is the laboratory located?  
What agency seized the exhibit?  
Where was the exhibit seized? (If an obscure locale, give distance and direction from the nearest city)  
Were there any special circumstances of the seizure (traffic stop, unusual smuggling technique, etc.)  
What controlled substance was suspected upon submission?  
Detailed physical description (appearance, dimensions, logos, odor, packaging, etc.)  
Quantities (numbers of tablets, packages or bricks, average mass, total net mass, etc.)  
Photos (see additional information, below)  
What techniques were used to analyze the exhibit?  
Actual composition of the exhibit?  
Quantitation data? (if not quantitated, provide a qualitative approximation if possible)  
Adulterants and diluents? (if identified, especially if unusual)  
First seizure of this type? (if not, provide brief details of previous examples)  
Editorial comments? (if any)  
Literature references? (If any)

In order to avoid confusion, if uncommon controlled substances are identified, the description should use the full chemical name(s) of the identified substances (if desired, acronyms or street terminology (e.g., “Foxy-Methoxy”, “Nexus”, or “STP”) can be included in parentheses after the full chemical name).

Photographs should be provided as ATTACHMENTS, not as embedded images in documents. Jpeg images are preferred. Photographs should be of reasonable size - 250 KB or less per photograph. Unless the scale is obvious (which is uncommon), photographs of subject exhibit(s) should include either a metric ruled scale or a coin or bill (U.S. currency) to place the exhibit's size in context.

**Intelligence Alerts and Safety Alerts** are urgent communiques to the *Microgram Bulletin* readership which give notice of a specific forensic/drug-related enforcement and/or safety issue. In addition to the descriptive details listed under “Intelligence Briefs” above, they should include a concise synopsis of the issue, recommendations (if any), pertinent literature citations (if any are known), and a mechanism for providing feedback (if appropriate).

**Selected Intelligence Briefs** are reprinted (with permission) unclassified intelligence briefs of presumed interest to the *Microgram Bulletin* readership that have been previously published in restricted or non-restricted publications or websites that are also dedicated to the detection and analyses of suspected controlled substances for forensic/law enforcement purposes. Selected Intelligence Briefs must be unclassified, and should be a minimum of 1 page and a maximum of 10 pages in length (single spaced at 11 pitch Times New Roman font, including photos, tables, charts, etc.) All *Microgram Bulletin* subscribers are invited to submit such material, which must include the author's and publisher's contact information.

**Selected Literature References** is a monthly compilation of reference citations of presumed interest to the *Microgram Bulletin* readership, derived from approximately 2500 scientific periodicals. The focus of the Selected Literature References is the detection and analysis of suspected controlled substances for forensic/law enforcement purposes. References from clinical and toxicological journals are included only if the material is considered to be of high interest to forensic chemists (for example, contains the mass spectra of an unusual substance that is not known to be published elsewhere). Note that citations from obscure periodicals may be missed, and all *Microgram Bulletin* subscribers are invited to submit citations of interest if they do not appear in *Microgram Bulletin* within three months of their publication. Citations should include a summary sentence and the primary author's contact information.

**Meeting Announcements** is a monthly compilation of upcoming meetings of presumed interest to the *Microgram Bulletin* readership. **In general, only meetings which are dedicated to forensic chemistry/forensic drug analysis or include a subsection so dedicated will be publicized in *Microgram Bulletin*.** Meeting Announcements should include the Formal Title, Sponsoring Organization, Inclusive Dates, Location (City, State, and specific locale), Meeting Registration Costs and Deadline, Recommended Hotel Registration Costs and Deadline (include details on special rates where available), and Contact Individual's Name, Phone Number, and email Address. If available, the URL for the meeting website should also be included in the Announcement. Meeting Announcements will be posted for a maximum of three consecutive months, or (alternately) three times every other month over a five month period, but not past the registration deadline.

**Employment Opportunities** is a monthly compilation of job announcements of presumed interest to the *Microgram Bulletin* readership. **In general, only jobs with a forensic chemistry/forensic drug analysis focus for Federal, State, or Local Crime Laboratories or Offices will be publicized in *Microgram Bulletin*.** Exceptions may be requested and will be considered on a case-by-case basis. Employment Opportunity announcements should include the Formal Title of the Organization, Formal Title of the Laboratory or Office, Position Title, Laboratory or Office Location (City and State), Salary Range, Opening and Closing Dates, Duties, General Requirements, Specialized Requirements (if any), Application Procedures, and the Contact Individual's Name, Phone Number, email Address, and Mailing Address. If available, the URL for the agency's website, and (if available) the specific URL for the job posting should also be included in the Announcement. Employment Opportunities will be posted for a maximum of 3 consecutive months, but not past the application deadline.

#### **The Journal/Textbook Collection Exchange**

If any subscriber is interested in donating any forensic or analytical chemistry journal and/or textbook collection to a fellow subscriber or library, *Microgram Bulletin* is willing to list the offered materials and the associated contact information in a future issue (currently January, April, July, and October). The general format should follow the example in the January 2003 issue, and should be sent via email to the *Microgram* Editor at: [microgram\\_editor@mailsnare.net](mailto:microgram_editor@mailsnare.net) Only items for donation (not for sale) will be considered for publication, and donations to libraries should adhere to journal restrictions and/or time limits (if any) on such offers.

#### **Requests for *Microgram* and/or *Microgram Bulletin* Archives, 1967 - 2002**

All issues of *Microgram* (November 1967 - March 2002) and the first nine issues of its successor *Microgram Bulletin* (April - December, 2002) were and continue to be **Law Enforcement Restricted** publications, and are therefore (permanently) unavailable to the general public. [Note that this restriction includes requests made under the Freedom of Information (FOI) Act.]

Past issues or individual sections of issues (e.g., specific articles) are available to law enforcement affiliated offices and laboratories. Requests from such offices and laboratories **must be made on official letterhead** and mailed to:

Deputy Assistant Administrator  
Office of Forensic Sciences  
Drug Enforcement Administration  
2401 Jefferson Davis Highway  
Alexandria, VA 22301

Note that requests made via email will not be honored.

## DISCLAIMERS

1) All material published in *Microgram Bulletin* is reviewed prior to publication. However, **the reliability and accuracy of all published information are the responsibility of the respective contributors, and publication in *Microgram Bulletin* implies no endorsement by the United States Department of Justice or the Drug Enforcement Administration.**

2) Due to the ease of scanning, copying, electronic manipulation, and/or reprinting, **only the posted copies of *Microgram Bulletin* (on [www.dea.gov](http://www.dea.gov)) are absolutely valid.** All other copies, whether electronic or hard, are necessarily suspect unless verified against the posted versions.

3) **WARNING!:** Due to the often lengthy time delays between the actual dates of seizures and their subsequent reporting in *Microgram Bulletin*, and also because of the often wide variety of seizure types with superficially similar physical attributes, published material cannot be utilized to visually identify controlled substances currently circulating in clandestine markets. **The United States Department of Justice and the Drug Enforcement Administration assume no liability for the use or misuse of the information published in *Microgram Bulletin*.**

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# Microgram

## *Bulletin*

**Published by:**

**The Drug Enforcement Administration  
Office of Forensic Sciences  
Washington, DC 20537**

**The U.S. Attorney General has determined that the publication of this periodical is necessary in the transaction of the public business required by the Department of Justice. Information, instructions, and disclaimers are published in the January issues.**

**- FEBRUARY 2006 -**

**- INTELLIGENCE ALERT -**

### **LSD BLOTTER ACID MIMICS (CONTAINING 2,5-DIMETHOXYAMPHETAMINE (DMA)) IN HIGHTSTOWN, NEW JERSEY**

The New Jersey State Police Office of Forensic Sciences, Central Laboratory (Hamilton) recently received three blotter paper rectangles, one plain, two with a black, multi-stripe pattern, suspected LSD “blotter acid” (see Photo 1; scale is in inches). The exhibits were part of a polydrug seizure by the Hightstown Police Department, pursuant to a vehicle stop for DWI (Hightstown is located just off the New Jersey Turnpike about midway between Trenton and New Brunswick). The other exhibits in the case included marijuana, clonazepam, and several prescription tablets (not further specified). Analysis of an extract of the blotter paper squares by GC/MS, however, indicated not LSD but rather 2,5-dimethoxyamphetamine (commonly abbreviated as DMA or sometimes as 2,5-DMA; not formally quantitated, but a relatively low loading in all three pieces). This is the first time that DMA has been submitted to the laboratory in any form.



**Photo 1**



**- INTELLIGENCE ALERT -**

**ECSTASY MIMIC TABLETS (CONTAINING CAFFEINE, METHAMPHETAMINE, LIDOCAINE, AND AN UNKNOWN PHENETHYLAMINE) IN BROWARD COUNTY, FLORIDA**

The Broward Sheriff's Office Crime Laboratory (Fort Lauderdale, Florida) recently received five bags containing in total approximately 500 green tablets, each with a Nike "swoosh" logo, alleged MDMA (see Photo 2). The exhibits were acquired in an undercover operation in Broward County by the Broward Sheriff's Office.

Analysis of the tablets (total net mass 150.8 grams) by GC/MS and also by GC/MS after chemical derivatization with heptafluorobutyric anhydride (HFBA) indicated a mixture of caffeine, methamphetamine, lidocaine, trace MDMA, and an unknown phenethylamine, possibly 3,4-methylenedioxydimethylamphetamine (MDDMA). The primary component was caffeine; the methamphetamine and the unknown phenethylamine were present at about 3 percent, and the lidocaine at about 4 percent, relative to the caffeine. This was the first submission of these type Ecstasy mimic tablets to the laboratory. Of interest, the suspect also had a methamphetamine smoking pipe and Seroquel 200 tablets (quetiapine fumarate, a prescription antipsychotic) in his possession.



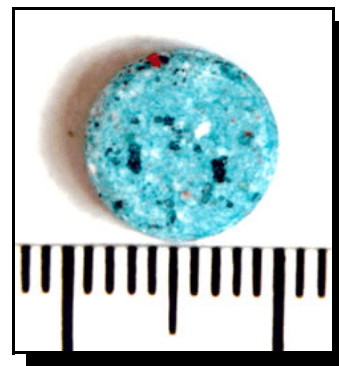
**Photo 2**

\* \* \* \* \*

**- INTELLIGENCE ALERT -**

**ECSTASY MIMIC TABLETS (CONTAINING 1-(4-CHLOROPHENYL)-PIPERAZINE (cPP)) IN NAPLES, ITALY**

The Laboratorio Indagini Chimiche of the Gabinetto Interregionale di Polizia Scientifica per Campania e Molise (Naples, Italy) recently received 92 mottled turquoise tablets, 9 x 3.6 millimeters, no logo, suspected MDMA (see Photo 3). The exhibits were seized by the Railway Police of Naples (details not available). Analysis of the tablets (total net mass 26.86 grams) by color tests and GC/MS, however, indicated not MDMA but rather 1-(4-chlorophenyl)-piperazine (commonly abbreviated as cPP; not formally quantitated, but roughly 5 - 10 percent). cPP is not currently scheduled under Italian law. This was the first submission of cPP-containing tablets to the Polizia Scientifica Laboratory system.



**Photo 3**

**- INTELLIGENCE ALERT -**

**COCAINE IN PAINTED WICKER BASKETS  
AT MIAMI INTERNATIONAL AIRPORT**

The DEA Southeast Laboratory (Miami, Florida) recently received 23 brightly colored wicker baskets containing a white powder, suspected cocaine (see Photo 3). The exhibits were seized by Immigration and Customs Enforcement (ICE) from a passenger arriving at Miami International Airport on a flight from Haiti. The powder was contained inside plastic sleeves (see Photo 4; displayed oversize to show detail), which were inside hollow, very thin-walled wooden tubes, which were in turn wrapped with brightly colored cloths; the resulting “wickers” were then assembled into the baskets. Analysis of the powder (total net mass 14.80 kilograms) by GC/MS and FTIR confirmed 82 percent cocaine hydrochloride. This is the first submission of this type to the Southeast Laboratory.



**Photo 3**



**Photo 4**



**- INTELLIGENCE ALERT -**

**PHARMACEUTICAL MORPHINE SULPHATE TABLET MIMICS  
(CONTAINING HEROIN) IN NEW YORK**

The DEA Northeast Laboratory (New York, New York) recently received a submission of 900 white tablets contained in apparently commercial blister packs, labeled in part as: "Each uncoated tablet contains morphine sulphate USP 30 mg." (see Photo 5). However, the labeling had no manufacturer's logo, or place of manufacture. The exhibit was seized in New York by the DEA New York Field Division pursuant to an Internet pharmacy investigation, along with other blister-packed pharmaceuticals. The tablets were half scored, weighed 204 milligrams each, and had a somewhat degraded appearing surface coating. Scraping off the surface layer revealed a brown and white granular interior, not consistent with a pharmaceutical preparation (see Photo 6). Analysis of the tablets (total net mass 184.3 grams) by TLC, GC/FID, GC/MS, and FTIR/ATR indicated not morphine sulfate but rather 15 milligrams of heroin base per tablet. This is the first submission of morphine sulfate tablet mimics containing heroin to the Northeast Laboratory.



**Photo 5**



**Photo 6**

\* \* \* \* \*

**- INTELLIGENCE BRIEF -**

**TEN YEAR OLD BLACK TAR HEROIN ANALYZED  
AT THE DEA SOUTHWEST LABORATORY**

The DEA Southwest Laboratory (Vista, California) recently received a request for an analysis on a ten year old black tar heroin exhibit. The original seizure was made in late 1995 by U.S. Customs Service (USCS) personnel at the Nogales, Arizona Point of Entry, but was not analyzed at that time because the suspect escaped back into Mexico (he recently returned to the United States and was apprehended). The evidence originally consisted of a single package of suspected black tar heroin, wrapped in clear plastic and black electrical tape. USCS agents opened the package (in 1995) to conduct field testing (positive for heroin) and the evidence was re-packaged in two portions: Most of the sample was left in its original wrapping, but the small portion that was removed for field testing was re-packaged in a separate evidence envelope.

Upon submission for analysis (in 2005), the two portions were analyzed as separate exhibits. The smaller portion (total net mass 6.4 grams (see Photo 7)) had a dry texture; analysis by GC/MS and GC/FID confirmed 22 percent heroin and 51 percent O6-monoacetyl-morphine (both calculated as the hydrochlorides). The larger portion (total net mass 204.7 grams) was still gummy and moist from being sealed in its original plastic packaging; analysis (same techniques) confirmed 4.1 percent heroin and 63 percent O6-monoacetylmorphine (again, both calculated as the hydrochlorides). This is believed to be the first analyses of ten year old black tar heroin exhibits by the Southwest Laboratory.



**Photo 7**

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### **- INTELLIGENCE BRIEF -**

### **OPIUM IN ISTANBUL, TURKEY**

The DEA South Central Laboratory (Dallas, Texas) recently received a submission of alleged opium from the DEA Houston Field Division (see Photo 8). The exhibit was originally seized by the Turkish National Police in Istanbul, and was transferred to DEA custody for a controlled delivery in the United States (circumstances withheld). The dark-colored, gummy sample was 12 x 6.5 x 3.5 inches, was wrapped in both clear and dark colored plastic, and was transported inside a suitcase. Analysis of the material (total net mass 3,857 grams) by GC/MS and GC/IR identified morphine, codeine, thebaine, papaverine, and noscapine, confirming opium (alkaloids not quantitated). Submissions of opium to the South Central Laboratory are not uncommon, but the amount in this case was unusually large.



**Photo 8**

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[Selected references are a compilation of recent publications of presumed interest to forensic chemists. Unless otherwise stated, all listed citations are published in English. Listed mailing address information (which is sometimes cryptic or incomplete) exactly duplicates that provided by the abstracting service. Patents are reported only by their *Chemical Abstracts* citation number.]

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### Additional References of Possible Interest:

1. Petrisor I. **Sampling and analyses - Key steps of a forensics investigation.** *Environmental Forensics* 2005;6(1):1. [Editor's Notes: A review. Focus is on environmental forensics, with an emphasis on representativeness of sampling. Contact: USA (no further addressing information was provided).]

The proper collection and preservation of original digital evidence is the most important issue facing today's Digital Evidence and Computer Forensic programs, whether at the federal, state, or local level. Failure to protect evidence can result in the discrediting of examiners, impeachment of findings, and failed prosecutions.

Over the past 15 years, significant technological advances have been made in the area of hard drive write blocking technology. Current technologies allow computer forensic examiners to write block the original evidence utilizing either a software or hardware based approach.

### **Software-Based Write Blocking Technology**

In technical terms, these tools work by preventing access to the hard drive through the Interrupt 0X13 BIOS interface of a PC. In layman's terms, they monitor I/O commands sent from the PC to the hard drive, and block any commands that could modify the data on the hard drive. They are effective regardless of the type of hard drive.

Software-based write blocking started during the DOS and Unix era, and has evolved into the (current) Graphical User Interface (GUI) era. Many of the companies that developed digital evidence examination software have stayed with software-based tools for hard drive write blocking (rather than developing hardware to do the job). One of the advantages of this approach is that the tool(s) could be developed as part of the complete computer forensic examination software suite. Doing so not only saved money and development time for the software company, but also saved money and time for the computer forensic/digital evidence programs (no need to purchase additional hardware, and a gentler learning curve).

### **Hardware-Based Write Blocking Technology**

At present, hardware-based approaches are the preferred method for hard drive write blocking. This technology uses a combination of hardware and firmware to prevent a PC's operating system to write to a hard drive. The hardware currently come in many different configurations. One of the most popular and preferred configuration is Integrated Development Environment (IDE). The second most popular and also one of the most reliable configurations is Small Computer System Interface (SCSI). Other recently developed configurations are FireWire, Universal Serial Bus (USB), and the newest form Serial ATA (also known as SATA).

### **Testing**

The U.S. Department of Commerce, National Institute of Standards and Technology (NIST) and the U.S. Department of Justice, Office of Justice Programs, National Institute of Justice (NIJ) have conducted extensive testing of both forms of hard drive write blocking technologies. With increasing numbers of available hardware and software technologies, both NIST and NIJ have posted their testing results on their respective websites, so that computer forensic organizations



and laboratories can make educated decisions on which type to utilize for acquisition and examination of original evidence.

This information is also useful in court proceedings, to demonstrate that the methods and tools utilized during the collection and examination of original evidence were sound, and have been proven to work.

### **Conclusions**

Failure to protect original evidence can enable a defense attorney to assert that the evidence was subject to changes by the examiner or any other person(s) with access. There are a variety of tested and reliable hard drive write blocking technologies currently available to the computer forensic examiner. Protecting original evidence by write blocking must be a standard operating procedure for all computer forensic examiners.

Questions or comments? E-mail: [Walter.Aponte -at- usdoj.gov](mailto:Walter.Aponte-usdoj.gov)

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# Microgram

## *Bulletin*

**Published by:**

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The U.S. Attorney General has determined that the publication of this periodical is necessary in the transaction of the public business required by the Department of Justice. Information, instructions, and disclaimers are published in the January issues.

- MARCH 2006 -

- INTELLIGENCE ALERT -

### HEROIN - FENTANYL MIXTURES IN CLEVELAND, OHIO

The DEA North Central Laboratory (Chicago, Illinois) recently received two exhibits of small paper bindles containing a medium brown, finely divided powder, suspected heroin (see Photo 1). Unusually, the bindles were crafted from Ohio state lottery number selection forms. The exhibits were obtained in Cleveland as part of an ongoing investigation by the DEA Cleveland Resident Office, the Summit County Sheriff's Department, and the Ohio Bureau of Criminal Investigation and Identification. The first exhibit consisted of 15 bindles and contained in total 0.32 grams of powder, whereas the second exhibit consisted of 50 bindles and contained in total 1.2 grams of powder; individual bindles contained from 16 to 31 milligrams of powder. Analysis by GC, GC/MS, and IR identified a mixture of benzocaine,



**Photo 1**

diphenhydramine, procaine, acetylcodeine, mono-acetylmorphine, heroin, fentanyl, and lactose. The heroin quantitations in the two exhibits were 8.1 percent and 2.9 percent, respectively (both calculated as the hydrochloride salt). The fentanyl levels were not formally quantitated, but were estimated to be approximately 5 and 4 percent, respectively. This was the third submission of heroin - fentanyl mixtures to the North Central Laboratory since January 2005.

[Editor's Notes: The levels of fentanyl in these exhibits are unusually high. According to the analyst, approximately 10 recent drug overdose deaths in the Chicago, Illinois area were possibly due to similar heroin - fentanyl mixtures (not confirmed, pending autopsy results).]

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### **- INTELLIGENCE ALERT -**

#### **ECSTASY TABLETS CONTAINING CAFFEINE, MDMA, AND KETAMINE, OR CAFFEINE, MDMA, AND METHAMPHETAMINE, IN OAKLAND, CALIFORNIA**

The Oakland Police Department Crime Laboratory (California) recently received a polydrug submission including marijuana, cocaine base, and six blue tablets with a "thumbs up" logo, suspected MDMA (see Photo 2). The exhibits were seized in Oakland by the Oakland Police Department pursuant to a reckless driving arrest. The tablets were round, 9 millimeters diameter x 4 millimeters thickness, and weighed approximately 310 milligrams each. Analysis by GC/MS indicated a mixture of caffeine, MDMA, and ketamine (not formally quantitated, but in an approximate 10 : 9 : 1 ratio). This is the first submission of mixed caffeine/MDMA/ketamine tablets to the laboratory. However, the laboratory has previously received several separate submissions of yellow "thumbs-up" logo tablets (8 millimeters diameter x 5 millimeters thickness, and also approximately 310 milligrams each) that GC/MS analysis indicated contained caffeine, MDMA, and methamphetamine (in an approximate 11 : 8 : 1 ratio; see Photo 3).

[Editor's Note: Subsequent to the initial submission of this Intelligence Alert, the laboratory received a plastic bag containing 24 of the blue caffeine/MDMA/ketamine tablets and 13 of the yellow caffeine/MDMA/methamphetamine tablets (no further details). The analyst in this case also suggested that the logo could be viewed as a "thumbs-down" logo. It has also been (less commonly) referred to as the "hitchhiker" logo.]



**Photo 2**



**Photo 3**

**- INTELLIGENCE ALERT -**

**ECSTASY TABLETS CONTAINING ASPIRIN AND MDA  
IN FORT LAUDERDALE, FLORIDA**

The Broward Sheriff's Office Crime Laboratory (Fort Lauderdale, Florida) recently received 200 blue tablets with a heart logo, suspected MDMA (see Photo 4). The tablets were seized by the Fort Lauderdale Police pursuant to a traffic stop in Fort Lauderdale. Analysis of the tablets (total net mass 50.28 grams) by GC/MS, however, indicated not MDMA but rather aspirin and 3,4-methylenedioxyamphetamine (MDA), the latter possibly as the acetate salt. A secondary analysis following derivatization with heptafluorobutyric anhydride (HFBA) confirmed MDA. The tablets were not formally quantitated, but were estimated to contain between 15 and 50 milligrams of MDA each. The laboratory has seen these same tablets on several previous occasions, but this was the largest submission of them to date.



**Photo 4**

[Editor's Notes: According to the analyst, the "acetate salt" was likely an artifact resulting from the presence of aspirin (however, N-acetyl-MDA was *not* identified). The analyst also suggested that the "heart" logo was a special marketing tactic, as the various submissions of these tablets occurred around Valentine's Day.]

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**- INTELLIGENCE ALERT -**

**COCAINE HYDROCHLORIDE EMBEDDED ON PLASTIC  
IN BALTIMORE, MARYLAND**

The DEA Mid-Atlantic Laboratory (Largo, Maryland) recently received a large number of plastic strips (not counted) with a brown substance either embedded into or affixed onto them, suspected heroin (see Photo 5). The strips were mailed from Trinidad, and were seized by U.S. Customs personnel in Baltimore. The strips (total net mass 405.6 grams) were of varying sizes, the largest being approximately 4 x 8 inches and the smallest being approximately 0.5 x 3 inches. Some of the strips were partially packaged in incense packaging, but most were loose in the box, and the mailing information did not mention incense. Analysis by GC, IR, and GC/MS, however, indicated not heroin but rather 43 percent



**Photo 5**



cocaine hydrochloride, adulterated with phenacetin (the quantitation value is relative to the total weight of the strips (including the plastic)). According to the analyst, this was the first such submission to the Mid-Atlantic Laboratory.

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**- INTELLIGENCE BRIEF -**

**FRESH KHAT SEIZED NEAR EDINBURGH, OHIO**

The Ohio State Highway Patrol Crime Laboratory (Columbus) recently received 195 leaf wrapped bundles of plant material, suspected khat (see Photo 6). The exhibits were being transported in two cargo duffels, and were seized by the Ohio State Highway Patrol/Ravenna Patrol Post pursuant to a traffic stop on Interstate 76 near Edinburgh, Ohio. The plant material (total net mass 17.1 kilograms) was put on ice by the seizing officers, and then frozen upon arrival at the laboratory, to minimize the conversion of cathinone to cathine prior to analysis. Following thawing and standard acid/base workup, analysis by GC/FID and GC/MS identified cathinone and cathine (not quantitated), confirming khat. The laboratory has previously received seizures of fresh khat, which were believed to be intended for local communities of expatriates from the eastern horn area of Africa. Intelligence indicated that this shipment was enroute to the Columbus area.



**Photo 6**

**- INTELLIGENCE BRIEF -**

**VERY LARGE SEIZURE OF KETAMINE HYDROCHLORIDE  
AT THE BLAINE, WASHINGTON POE**

The DEA Western Laboratory (San Francisco, California) recently received 50 packages of a fine, white, crystalline material, suspected ephedrine (see Photo 7). The packages were seized by Immigration and Customs Enforcement personnel at the Blaine, Washington POE, from inside the doors of a tractor-trailer arriving from Canada (further details not provided). Each package consisted of a large clear zip lock bag with clear tape around it, a FoodSaver bag, enclosing two smaller clear plastic baggies each containing the crystalline material (total net mass 49.68 kilograms). Screening by color testing (Chen's test), however, indicated that the material was *not* ephedrine. Further analysis by FT-IR and GC indicated 89 percent ketamine hydrochloride. This is the largest ketamine exhibit ever submitted to the Western Laboratory.



**Photo 7**

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**- INTELLIGENCE BRIEF -**

**WHITE HEROIN SUBMISSION IN PHOENIX, ARIZONA**

The Phoenix Police Department Laboratory Services Bureau (Arizona) recently received a multiply wrapped bundle (18 x 10 x 2.5 inches) containing compressed and loose off-white powder, suspected heroin (see Photo 8; note that the powder is whiter than it appears in the photo). The exhibit was seized by Phoenix Police Department Drug Enforcement Bureau Detectives from a false bottomed duffel bag being transported by a drug courier who was travelling from California to New York (further details withheld in accordance with *Microgram* policy). The powder was contained in three separate sections each wrapped in brown packaging tape, then overwrapped in black plastic and electrical tape. Analysis of the powder (total net mass 3.4 kilograms) by color testing (Marquis), microcrystal testing (mercuric iodide), and GC/MS confirmed heroin (not quantitated, but high purity based on the chromatography and intense reaction with the Marquis reagent). The laboratory commonly receives "black tar" heroin; however, white heroin is quite rare, and this was in fact the largest submission of white heroin ever submitted to the laboratory.



**Photo 8**



**- CORRECTION -**

Sir: Concerning the Intelligence Alert entitled: "Ecstasy Mimic Tablets (Containing 1-(4-Chlorophenyl)piperazine (cPP)) in Naples, Italy" (*Microgram Bulletin* 2006;39(2):18), further analysis has indicated that the active component was actually 1-(3-chlorophenyl)-piperazine (also known as mCPP). That is, the *meta*- (1,3-), not the *para*- (1,4-), isomer. The original identification was based on mass spectrometry, which is unable to differentiate between the two isomers. Secondary analysis by NMR, and comparison of GC retention times against reference standards, confirmed that the compound was actually the *meta*- isomer. Additional quantitation work indicated that each tablet contained 22 milligrams of mCPP. This compound is not controlled under Italian law.

[Editor's Notes: For a recent update concerning the abuse of mCPP as an MDMA-mimic, see: Bossong MG, Van Dijk JP, Niesink RJM. Methylone and mCPP, two new drugs of abuse? *Addiction Biology* 2005;10:321.]

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**- SPECIAL INTELLIGENCE BRIEF -**

**KRATOM (*MITRAGYNA SPECIOSA*)**

The DEA Special Testing and Research Laboratory (Dulles, Virginia) recently received a sample of Kratom (*Mitragyna speciosa*) from the Bureau of Customs and Border Protection (Chicago, Illinois), for research purposes (see Photo 9). *Mitragyna speciosa* is a member of the *Rubiaceae* (coffee) family, and is indigenous to southeast Asia, notably in Thailand and Malaysia. Kratom is the original, common name used in Thailand - which has since become the predominant name used worldwide - but *Mitragyna speciosa* has at least half a dozen other common names (e.g., it is known as "Biak-Biak" in Malaysia).



Photo 9

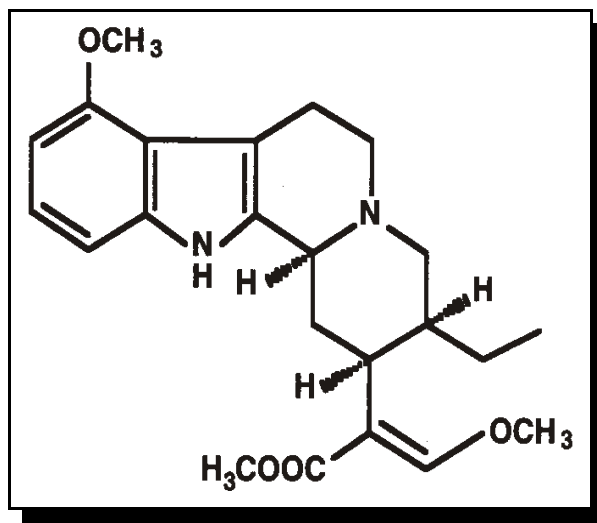
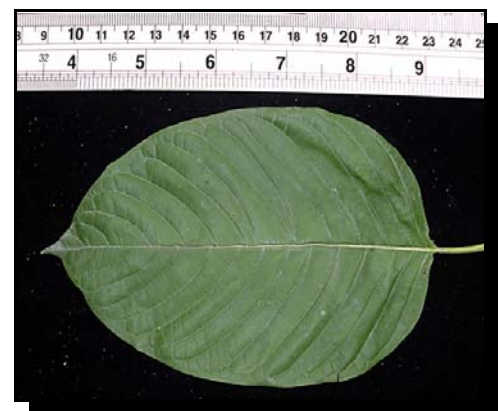


Figure 1

The Kratom tree can reach over 50 feet in height and over 15 feet in diameter (see Photo 10). The leaves (see Photo 11) have been traditionally used by Thai and Malaysian natives for brewing tea, smoking, or chewing, for medicinal purposes, and as a substitute for opium. More than 20 alkaloids have been identified in Kratom by various researchers; the most abundant is mitragynine, an indole alkaloid (see Figure 1, previous page). Takayama reported 66.2 percent mitragynine in the crude base extract of young Kratom leaves from Thailand [1]. Interestingly, mitragynine is not found in any other species of *Mitragyna* [2]. Several analogues of mitragynine, namely paynantheine, speciogynine, speciociliatine, and 7- $\alpha$ -hydroxy-7H-mitragynine, are also found in Kratom extracts [1]. Analysis of a methanol extract with GC/MSD identified both mitragynine and another alkaloid, rhynchophylline [3]. Although Kratom is relatively new in the forensic science arena, there are dozens of scientific papers describing the identification, isolation, and pharmacology of its alkaloids. It is interesting to note that the “low dose” effects from the chewing of whole Kratom leaves are described to be stimulating, while “high dose” effects of Kratom extracts are more akin to a narcotic analgesic (i.e., opium-like). In the study of the analgesic activity of Kratom and its constituents, Takayama concluded that the crude extract of the leaves has an opioid agonistic effect [1]. Mitragynine itself is documented to be a depressant [2]. The United Nations published a report in 1975 about the addictive nature of Kratom alkaloids; the researcher studied 30 Thai users for the article [4]. Jansen and Prast described mitragynine as a drug with a highly unusual but well-documented history as both a depressant and a stimulant while possessing the chemical structure of a suspected psychedelic [5].



**Photo 10**



**Photo 11**

As of March 2006, Kratom is not a controlled substance in the United States. However, it is controlled in Thailand, Malaysia, and Myanmar (Burma). In 2004, mitragynine and Kratom were both placed in Schedule 9 (the most restrictive level) of the Australian National Drugs and Poisons Schedule.

An Internet search confirmed a large number of Kratom vendors in the United States. Kratom is delivered to the U.S. both from Asia and from western European countries, and shipments commonly pass undetected through U.S. Customs. It is sold in various forms, including leaves, extracts, and powders. Vendors also promote the use of Kratom and provide detailed

instructions on its preparation, use, and effects. A large and growing number of personal testimonials are also available on the Internet, describing the various effects of the different Kratom-based products.

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## NEW EMAIL ADDRESSES NEEDED

The email addresses for the following organizations returned rejection notices to the *Microgram* Editor for at least the past three issues of *Microgram Bulletin*, and therefore the respective organizations have been dropped from the subscription list. Note that the errors include "mailbox full", "over quota", "user not found", or "user unknown" messages, and also a variety of anti-spam/filtering messages (the latter resulting from failure to "whitelist" the [microgram\\_editor@mailsnare.net](mailto:microgram_editor@mailsnare.net) address). The *Microgram* Editor requests your assistance in contacting these organizations, determining if they wish to remain on the *Microgram* subscription e-net, and if so asking them to forward a valid email address to the [microgram\\_editor@mailsnare.net](mailto:microgram_editor@mailsnare.net) address. In addition, if the Office is closed or is no longer interested, please forward that information to the *Microgram* Editor.

### **U.S. Subscribers (by State, except U.S. Government organizations):**

California - Bakersfield Police Department Crime Laboratory; Fresno County Sheriff's Department; Riverside Police Department/Narcotics Unit; San Diego Sheriff's Crime Laboratory;

Colorado - Boulder Police Department;

Delaware - Delaware State Police Crime Laboratory/Dover;

Georgia - Northwestern Technical College/Department of Criminal Justice/Rock Spring;

Indiana - Clinton City Police Department; Greenwood Police Department Crime Laboratory;

Kentucky - Kentucky State Police/Central Forensic Laboratory/Frankfort;

Louisiana - New Orleans Police Department Crime Laboratory;

Maine - ODV, Inc./South Paris;



Massachusetts - Massachusetts State Police Crime Laboratory/Sudbury;

Mississippi - University of Southern Mississippi/Forensic Science Program/Hattiesburg;

Montana - Montana State Forensic Science Division Laboratory/Missoula;

Nevada - Washoe County Sheriff's Office;

New Mexico - Albuquerque Police Department Laboratory; New Mexico Department of Public Safety/Southern Crime Laboratory/Mesilla Park;

New York - Onondaga County Center for Forensic Sciences/Syracuse;

North Carolina - Greensboro Police Department-Vice/Narcotics Unit; North Carolina State Bureau of Investigation/Drug Chemistry Section/Raleigh; North Carolina State Bureau of Investigation/Raleigh Crime Laboratory; North Carolina State Bureau of Investigation/ Western Regional Laboratory;

Ohio - Cuyahoga County Coroner's Office/Cleveland; Defiance College Chemistry and Forensic Science Department; Newark Police Department Forensic Services;

Oklahoma - Oklahoma State Bureau of Investigation/Tahlequah Laboratory;

Pennsylvania - St. Mary's Police Department;

Tennessee - East Tennessee State College of Medicine/Johnson City;

Texas - Bexar County Forensic Science Center/San Antonio; Forensic Consultant Services/Ft. Worth; Nacodoches County Sheriff's Office; Northeast Texas Narcotics Task Force/Henderson; Texas Department of Public Safety Crime Laboratory/Garland; Texas Department of Public Safety Crime Laboratory/Houston; Travis County Office of the Medical Examiner/Austin; University of Texas at Dallas Police Department/Richardson;

U.S. Government - U.S. Customs Laboratory/San Francisco; U.S. Customs Laboratory Headquarters/Washington, DC; U.S. Department of Energy/Lawrence-Berkeley National Laboratory; U.S. Department of Energy/Los Alamos National Laboratory; U.S. Department of Energy/Oak Ridge National Laboratory; U.S. Department of Justice/CSOSA/PSA/Forensic Toxicology Drug Laboratory/Washington, DC;

Washington (State) - Seattle Police Department Crime Laboratory;

Washington, DC - DC Addiction Prevention and Recovery Administration.

**Non-U.S. Subscribers (by Country):**

Australia - Australian Customs/Canberra; Australian Federal Police/Forensic and Technical Division/New Sydney;

Canada - Manitoba Justice/Winnipeg, Manitoba; Maxxam Analytics/Mississauga, Ontario;

Colombia - Institute Nacional de Medecina Legal Y Ciencias Forenses/Bogota; UNODCCP - Colombia-Ecuador/Bogota;

Denmark - University of Copenhagen/Institute of Forensic Medicine;

Fiji - Fiji Forensic Laboratory/Nausori;

Finland - Finnish Customs Laboratory/Espoo; National Bureau of Investigation/Vantaa;

France - Institut de Medicine Legale/Strasbourg; IRCGN/Rosny; Laboratoire des Douanes de Paris; Laboratoire des Douanes de Lille; Prefecture de Police/Laboratoire de Toxicologie/ Paris;

Germany - Institute Fur Rechtmedizin/Muenchen; Institute Fur Rechtmedizin/Universitat der Saarlandes/Hamburg; Landeskriminalamt Kiel Laboratory; Landeskriminalamt Rheinland-Pfalz/Mainz;

Greece - General Chemical State Laboratory/Thessaloniki;

India - Tripura State Forensic Science Laboratory/West Tripura;

Indonesia - National Agency of Drug and Food Control/Jakarta;

Ireland - State Laboratory/Dublin; Office of the Provost Marshall and Director of Military Police/County Tipperary;

Israel - Israeli Anti-Drug Authority/Jerusalem;

Italy - U.O. Tossicologia Forense E Antidoping/University Padova;

Japan - Iwate Prefectural Police Headquarters;

Panama - Policia Tecnica Judicial;

South Africa - South African Police Service/Forensic Science Laboratory/Capetown; South African Police Service/Forensic Science Laboratory/Kwa-Zulu Natal; South African Police Service/Forensic Science Laboratory/Western Cape;

Spain - Laboratorio de Toxicologia/Sevilla; Laboratorio Territorial de Drogas/Barcelona;

Switzerland - University of Bern/Clinical Research Department; University of Lausanne/Institut de Police Scientifique;

Turkey - Department of Criminal Police Laboratories/Ankara; Istanbul University/Institute of Forensic Sciences;

United Kingdom - Dundee Police Forensic Science Laboratory/Dundee, Scotland; Forensic Science Center/London, England; Royal Hallamshire Hospital/Sheffield; State of Jersey/ Official Analysts Laboratory/Jersey, England; States Analysts Department/Channel Islands;

Venezuela - National Guard/Caracas.

Tool validation testing is critical to the computer forensic examination process. Validation demonstrates that the examination tools (hardware and software), techniques, and procedures are suitable for forensic examinations, and ensure that the tools work as designed. Software tools and hardware devices should always be tested prior to their initial use in a digital evidence application. This is required under the American Society of Crime Laboratory Directors/ Laboratory Accreditation Board (ASCLD/LAB) *International* accreditation.

Tool validation testing should be performed whenever new, or upgraded versions are introduced into the forensic process. The software tools and hardware devices should be tested against a known entity. The validation process must be documented in sufficient detail to enable an independent replication. The testing of the software or hardware should be completed by at least three different computer forensic examiners using three different computers and operating systems.

Each test examiner must create a summary report of their test results. If the test failed, the examiner must annotate where the failure took place. The summary report should contain their notes concerning the tool being tested, the version, and the date in which the test was performed. The report should also state the overall pass/fail status of the tool and any recommendations or concerns regarding the outcome of the testing.

Here are a few of the software tools and hardware devices that are currently used within the DEA Digital Evidence Laboratory:

**HARDWARE:** These devices are used to protect the original or best evidence from being erased or altered.

- a) Guidance IDE Write Block
- b) Guidance SCSI Fast Block
- c) Weibe Tec Write Block
- d) Airlite Write Block
- e) Digital Intelligence Write Block

**SOFTWARE - Baseline:** These tools acquire and interpret media formatted in various file structures.

- a) Encase version 4
- b) Ilook version 8

**WIPING:** These tools are used to wipe/clean a hard drive of any data (i.e., prior to the beginning of a case examination).

- a) Unix dd version 2.4.1.8-14
- b) DCFLDD version 1.0
- c) AIR version 1.2.3
- d) SMART version Arthur 1
- e) FIRE version 4.0a

**BROWSING/FILE VIEWING:** These tools are used to view various file types (Word doc, Excel, etc.)

- a) Quickview Plus version 7.0
- b) Thumbsplus version 5.01
- c) ACDsee version 5.0
- d) Click View version 2.1
- e) Irfranview version 3.85

**E-MAIL / CHAT RECOVERY:** These tools are used to recover email/chat (Hotmail, PST, etc.)

- a) Paraben versions 3.0 and 4.0
- b) Paraben NEBX version 1.7.178
- c) Exmerge version 2000
- d) Data Lifter version 2.184
- e) DB Extract version 3.7 and 4.5
- f) FTK version 1.41 and 1.43
- g) NetAnalysis version 1.34

**UTILITY SOFTWARE:** These tools are used for a wide variety of purposes.

- a) Winhex version 9.82
- b) MD-5 Hash
- c) CD Creator version 6.0
- d) CDR Investigator
- e) CDR Diagnostic version 2.0.2
- f) Nero ROM Burner version 6.0
- g) Reg Dat version 1.3
- h) RegDat-XP version 1.1

**PASSWORD CRACKING:** These tools are used to access files that were password protected by the user.

- a) Access Data Stand Alone version 5.0
- b) Access Data Distributed Network Attack version 2.03
- c) Passware 2000 version 5.0

**ARCHIVE BACKUP UTILITIES:** These tools are use to back up the images created by the baseline tools (mentioned above), for archival purposes.

- a) NT Backup for tape version 5.0
- b) TAR for tape version 8.0
- c) FIT for DVD

If a new (unvalidated) tool is needed to complete an examination during the examination of DEA digital evidence, DEA policy allows its one-time use without prior validation. However, the examiner must get supervisory approval prior to proceeding. This must be documented and initialed by the approving supervisor within the examiner's case notes. If this tool is needed for any subsequent examinations, it must be first sent through the usual tool validation method.

The validation process can take from one to two days per tool. New tools are validated as needed. Current tools are re-validated when a new ***upgrade*** is acquired (e.g., version 3.0 to 4.0). However, this doesn't mean that the tool will be re-validated if there is merely an ***update*** of the software (e.g., version 3.0 to 3.01).

Questions or comments? E-mail: [Steven.L.Carter -at- usdoj.gov](mailto:Steven.L.Carter-usdoj.gov)

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# Microgram

## *Bulletin*

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**- APRIL 2006 -**

**- INTELLIGENCE ALERT -**

### **HASHISH INSIDE MARIJUANA BRICKS AT JFK AIRPORT, NEW YORK**

The DEA Northeast Laboratory (New York, New York) recently received 12 large brick-shaped packages of compressed plant material, apparent marijuana. The exhibits were seized at JFK Airport (New York) by U.S. Customs and Border Protection personnel (originating source and seizure details not available). Each package was wrapped with a combination of plastic and tape, and appeared to be typical marijuana bricks. However, upon disassembly, it was discovered that each brick contained a second, smaller package, also wrapped in plastic and tape, containing a gummy brown substance (see Photos 1, right, and Photo 2, next page). Analysis of the plant material (total net mass 6.97 kilograms) by microscopy, Duquenois-Levine color test, TLC, and GC/MS confirmed



**Photo 1 - Bricks are Approximately  
8 x 6 x 2 Inches**



marijuana. Analysis of the brown substance (total net mass 17.93 kilograms) using the same techniques indicated hashish. Neither exhibit was quantitated. The Northeast Laboratory has encountered a wide variety of concealment techniques, but this is the first submission of hashish inside marijuana bricks.

[Editor's Notes: Concealment of controlled substances within other controlled substances is sporadically encountered. In the cases that have been reported to *Microgram*, the inside (concealed) material was always the much more valuable substance (for example, heroin mini-bricks inside cocaine bricks). These unusual concealment efforts are generally considered to be an effort to dupe smuggling organizations - not law enforcement personnel. Such organizations typically charge for their services by both the total weight and the substance. More valuable substances are charged commensurately higher rates - to wit, in the present case, the charge for smuggling 18 kilograms of hashish would have been much more than for smuggling 25 kilograms of marijuana.]



**Photo 2 - Note Razor Blade in Lower Left Hand Corner for Scale**

\* \* \* \* \*

### **- INTELLIGENCE ALERT -**

### **CARDBOARD "SQUARES" CONTAINING HEROIN IN MIAMI, FLORIDA**

The DEA Southeast Laboratory (Miami, Florida) recently received 160 individual cardboard "squares" containing a dark gray, powdery substance, suspected heroin (see Photo 3). The exhibits were seized by DEA/Miami and the Coral Gables Police Department (originating source and seizure details not available). The "squares" were slightly irregularly cut (that is, not perfectly square), and also varied in size. Analysis of the powder (total net mass 5208 grams) by GC/MS and FTIR confirmed 70 percent heroin hydrochloride. It is not known whether this was the first such submission to the Southeast Laboratory.



**Photo 3**

\* \* \* \* \*

## **ECSTASY TABLETS CONTAINING MDMA AND METHAMPHETAMINE MIXTURES IN EASTERN KENTUCKY**

The Kentucky State Police Eastern Forensic Laboratory (Ashland, Kentucky) recently received four dark green tablets with a poorly defined butterfly logo, and one light green tablet with a “JK” logo, both suspected MDMA (see Photos 4 and 5). The exhibits were acquired by the Big Sandy UNITE Drug Task Force (Prestonsburg, Kentucky) during the execution of separate search warrants in Allen and Saylersville (both in eastern Kentucky). Analysis of the butterfly tablets by GC/MS and GC/FID indicated a mixture of methamphetamine, MDMA, diphenhydramine, lidocaine, and caffeine (the ratio of methamphetamine to MDMA was 1.2 : 1). Analysis of the “JK” tablet (also by GC/MS and GC/FID) indicated a mixture of methamphetamine, MDMA, and caffeine (methamphetamine : MDMA was 2.6 : 1). Both tablets were approximately 9 millimeters in diameter, but were not weighed. These were the first submissions of these type tablets to the laboratory.



**Photo 4**



**Photo 5**

\* \* \* \* \*

### **- INTELLIGENCE ALERT -**

## **LIQUID METHAMPHETAMINE IN TEQUILA BOTTLES AT THE SAN YSIDRO POINT OF ENTRY**

The DEA Southwest Laboratory (Vista, California) recently received two bottles of tequila (different brands), each containing a cloudy, gold colored liquid that field-tested positive for methamphetamine (see Photo 6). The bottles were seized by Immigration and Customs Enforcement Agents from a vehicle entering the United States at the San Ysidro (California) Point of Entry. Preliminary screening of the liquid inside the bottles by IR-ATR indicated that liquid was water-based. Analysis of a dried sample by IR-ATR confirmed methamphetamine hydrochloride. Quantitative analysis by HPLC indicated 487 milligrams/milliliter in the small bottle (total volume 1008 milliliters) and 490 milligrams/milliliter in the larger bottle (total volume 3003 milliliters). This is the first submission of “liquid methamphetamine” in tequila bottles to the Southwest Laboratory.



**Photo 6**

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**- INTELLIGENCE ALERT -**

**COCAINE AND HEROIN CO-SMUGGLED IN A LARGE METAL CYLINDER  
IN BOSTON, MASSACHUSETTS**

The DEA Northeast Laboratory (New York, New York) recently received a large, heavy metal cylinder which contained two different quantities of powders, one off-white and the other beige, suspected cocaine and heroin, respectively (see Photo 7). The cylinder was seized in Boston by U.S. Customs and Border Protection personnel (originating source and seizure details not available). The metal cylinder (38 inches long by 7 inches in diameter) contained an interior metal cylinder and then a ridged plastic cylinder within, which contained the powders; the powders were separated by a plastic sheet toward the center of the plastic cylinder (see Photo 8). Analysis of the off-white powder (total net mass 7.75 kilograms) by GC/MS, FT-Raman, and GC/FID confirmed 86 percent cocaine hydrochloride. Analysis of the beige powder (total net mass 8.19 kilograms) by GC/MS, FT-IR, and GC/FID confirmed 61 percent heroin hydrochloride, 30 percent cocaine hydrochloride, and thiamine hydrochloride. The Northeast Laboratory has previously encountered a variety of metal containers containing either cocaine or heroin, but this is the first submission in which both cocaine and heroin were co-smuggled in the same container. The actual (original) identity/purpose of the metal cylinder could not be determined.



**Photo 7**



**Photo 8**

\* \* \* \* \*



**- INTELLIGENCE ALERT -**

**N-BENZYLPIPERAZINE (BZP) AND 3-TRIFLUOROMETHYLPHENYL-PIPERAZINE (TFMPP) LABORATORY IN HOUSTON, TEXAS**

The DEA South Central Laboratory (Dallas, Texas) recently received multiple exhibits from a clandestine laboratory, including a tableting machine, a tumbler, 8,100 clear, gelatin capsules containing tan powder, 14,637 round, tan tablets with a poorly defined flying saucer or crown logo, and multiple plastic bags of tan powders, all suspected benzylpiperazine (BZP) (see Photos 9 and 10). The laboratory was located in a mini-storage facility in Houston, and was seized by agents from the DEA Houston Division. The capsules (total net mass 3146 grams) were 6.5 x 19 millimeters and weighed 388 milligrams each; analysis by GC/MS, GC/IRD, FTIR, and CE indicated a mixture of N-benzylpiperazine (BZP, 104 milligrams/capsule) and 3-trifluoromethylphenylpiperazine (TFMPP, not quantitated). The tablets (total net mass 2782 grams) were 8 x 4.5 millimeters and weighed 212 milligrams each; analysis by GC/MS, GC/IRD, FTIR, and CE indicated a similar mixture of BZP (57 - 67 milligrams/tablet) and TFMPP (not quantitated). The various bags of powders could be divided into three sets based on their analyses; the first group contained a total of 2704 grams of 75 percent BZP; the second group contained a total of 1830 grams of TFMPP (not quantitated); and the third contained a total of 1609 grams of mixed BZP and TFMPP (27 - 35 percent BZP (TFMPP not quantitated)). BZP is a Schedule I controlled substance commonly abused as a substitute for MDMA. TFMPP is currently not controlled, but is also commonly abused as a substitute for MDMA. This is the first submission of BZP/TFMPP capsules or tablets to the South Central Laboratory; however, the respective powders have been previously submitted.



**Photo 9**



**Photo 10**

\* \* \* \* \*

**- INTELLIGENCE ALERT -**

**LARGE FENTANYL / MDA / TMA LABORATORY IN AZUZA, CALIFORNIA**

**- POSSIBLY THE "OC-80" TABLET SOURCE -**

The DEA Southwest Laboratory (Vista, California) recently received multiple exhibits from a very large-scale clandestine laboratory, including various tablets (including apparent OC-80 logo Oxycontin® tablets), a variety of chemicals, and drug manufacturing recipes. The laboratory

(which included a tablet press) was located in Azuza (a suburb of Los Angeles), and was seized by personnel from the Los Angeles Sheriff's Department and Crime Laboratory (see Photos 11 and 12). The initial appraisal of this site suggested that MDMA was being manufactured; however, subsequent laboratory analyses and a review of the recipes (acquired from the Internet) confirmed that it was actually producing fentanyl and 3,4-methylenedioxyamphetamine (MDA).



**Photo 11**



**Photo 12**

The fentanyl appeared to be synthesized using the Siegfried route, and was found in both tablet and powder forms. One tablet exhibit contained 201 round, green tablets bearing the "OC 80" logo (total net mass 27.5 grams). These appeared to be distinctly undersized mimics of legitimate Oxycontin® tablets (which contain 80 milligrams of oxycodone; see Photos 13 and 14); however, analysis by GC, GC/MS, and IR indicated that these tablets actually contained 1.5 mg of fentanyl hydrochloride. Tablets like these have been seized throughout the country, and it appears that this lab was a source or possibly the source (could not be confirmed, because the tablet press, punches, and dies were not submitted). There were many thousands of these tablets at the laboratory.



**Photo 13**



**Photo 14**

Other Ecstasy-type tablets and associated powders were found to contain a combination of MDA, fentanyl, and caffeine. The tablets came in four different logos: A) A Lacoste® Alligator (268 tablets, total net mass 66.0 grams (see Photo 15)); B) An unusual character that appeared to be an elongated letter “C” and its mirror-image interlocked back-to-back, somewhat similar to the Chanel® logo (101 tablets, total net mass 22.4 grams (see Photo 16)); C) An “XL” (1 tablet, 240 milligrams (No Photo)); and D) A “K” (996 square white tablets, total net mass 223.3 grams (No Photo)). Analysis of the tablets (same techniques) indicated an average of 14.2 milligrams of MDA and 1.0 milligrams of fentanyl (average tablet weight 224 milligrams). The synthetic route to MDA was not determined; however, large amounts of safrole were among the chemicals seized at the laboratory (but 3,4-methylenedioxyphenyl-2-propanone (MDP2P) was not identified in any of the submitted samples).



**Photo 15**



**Photo 16**



**Photo 17**

Finally, 1640 blue, diamond-shaped tablets (total net mass 620.4 grams) were found to contain 2,4,5-trimethoxyamphetamine hydrochloride (TMA, quantitation not done due to lack of a reference standard (see Photo 17)). No ingredients or recipes for TMA were identified at the laboratory, and it was therefore concluded that these tablets were not produced at this site.

The Southwest Laboratory has previously received “OC-80” Oxycontin® mimic tablets; however, these were the first ever submissions of Ecstasy-type tablets containing mixtures of fentanyl, MDA, and caffeine, and of blue, diamond-shaped tablets containing TMA, to the laboratory. This is also the second fentanyl-producing clandestine laboratory encountered in southern California in the past year and a half.

\* \* \* \* \*

## SELECTED REFERENCES

[Selected references are a compilation of recent publications of presumed interest to forensic chemists. Unless otherwise stated, all listed citations are published in English. Listed mailing address information exactly duplicates that provided by the abstracting service. Patents are reported only by their *Chemical Abstracts* citation number.]

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3. Benson S, Lennard C, Maynard P, Roux C. **Forensic applications of isotope ratio mass spectrometry - A review.** Forensic Science International 2006;157(1):1. [Editor's Notes: A review. Includes "illicit drugs" (not specified in the abstract). Contact: Australian Federal Police, Forensic Services, GPO Box 401, Canberra 2601, Australia.]
  
4. Bieri S, Brachet A, Veuthey J-L, Christen P. **Cocaine distribution in wild *Erythroxylum* species.** Journal of Ethnopharmacology 2006;103:439. [Editor's Notes: Cocaine distributions in the leaves of 51 species of *Erythroxylum* were determined, using GC/MS. Contact: Laboratory of Pharmaceutical Analytical Chemistry, School of Pharmaceutical Sciences, EPGL, University of Geneva, 20 Bd d'Yvoy, 1211 Geneva 4, Switzerland.]
  
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10. Mali BD, Rathod DS, Garad MV. **Thin-layer chromatographic determination of diazepam, phenobarbitone, and saccharin in toddy samples.** Journal of Planar Chromatography - Modern TLC 2005;18(104):330. [Editor's Notes: Presents the title study (Note: "Toddy" is a crude alcoholic preparation consumed in poor areas of southern India, commonly adulterated

with the referenced drugs). Contact: Regional Forensic Science Laboratory, Aurangabad, 431 002 India.]

11. Rodriguez-Cruz SE. **Rapid analysis of controlled substances using desorption electrospray ionization mass spectrometry.** Rapid Communications in Mass Spectrometry 2006;20:53. [Editor's Notes: Licit and illicit tablets (not specified in the abstract), and also marijuana, were analyzed by DESI-MS, MS/MS, and ESI-MS/MS. Contact: U.S. Drug Enforcement Administration, Southwest Laboratory, 2815 Scott St., Vista, CA 92081.]
12. Sanagi MM, See HH. **High temperature liquid chromatography on a poly(styrene-divinylbenzene) stationary phase.** Journal of Liquid Chromatography & Related Technologies 2005;28(19):3065. [Editor's Notes: The title technique was applied to the separation of various barbiturates (not specified in the abstract). Contact: Univ Teknol Malaysia, Dept Chem, Fac Sci, Skudai 81310, Johor, Malaysia.]
13. Sellers K, Morehead R. **Efficient profiling of cocaine adulterants, using GC-MS and HPLC-RI.** LCGC North America 2005(Suppl.):91. [Editor's Notes: GC/FID and GC/MS are used for all adulterants and diluents studied, while HPLC-RI is used for determination of sugars. Contact: Restek Corporation, Bellefonte, PA 16823.]
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19. Wolf CE, Poklis A. **A rapid HPLC procedure for analysis of analgesic pharmaceutical mixtures for quality assurance and drug diversion testing.** Journal of Analytical Toxicology 2005;29:711. [Editor's Notes: Analyzed drugs include bupivacaine, clonidine, fentanyl, hydromorphone, midazolam, and morphine. Contact: Department of Pathology, Virginia Commonwealth University School of Medicine, P.O. Box 980165, Richmond, VA 23298.]
20. Wong R, Zoltek R. **Combination assay for alcohol and drugs of abuse.** (Patent) Chem. Abstr. 2006;144:102247v.

#### Additional References of Possible Interest:

1. Klous MG, Lee WC, Hillebrand MJX, van den Brink W, van Ree JM, Beijnen JH. **Analysis of diacetylmorphine, caffeine, and degradation products after volatilization of pharmaceutical heroin for inhalation.** Journal of Analytical Toxicology 2006;30(1):6. [Editor's Notes: Uses HPLC-DAD and MS to analyze the vapors from volatilizing a 75/25 mixture of pharmaceutical heroin and caffeine. [Note: This article appears to be quite similar to: Klous MG, Bronner GA, Nuijen B, vanRee JA, Beijnen JH. **Pharmaceutical heroin for inhalation: Thermal analysis and recovery experiments after volatilisation.** Journal of Pharmaceutical and Biomedical Analysis 2005;39(5):944.] Contact: Department of Pharmacy and Pharmacology, Slotervaart Hospital, Amsterdam, Netherlands.]
2. Lehner AF, Craig M, Fannin N, Bush L, Tobin T. **Electrospray [+] tandem quadrupole mass spectrometry in the elucidation of ergot alkaloids chromatographed by HPLC: Screening of grass or forage samples for novel toxic compounds.** Journal of Mass Spectrometry 2005;40(11):1484. [Editor's Notes: Presents the title study. Contact: Univ Kentucky, Livestock Dis Diagnost Ctr, Coll Agr, Lexington, KY 40512.]
3. Munro TA, Goetchius GW, Roth BL, Vortherms TA, Rizzacasa MA. **Autooxidation of salvinorin A under basic conditions.** Journal of Organic Chemistry 2005;70(24):10057. [Editor's Notes: Presents the title study. Contact: Univ Melbourne, Sch Chem, Mol Sci & Biotechnol Inst Bio21, Parkville, Vic 3010, Australia.]
4. Tanaka E, Honda K, Yasuhara H. **Ketamine: Its pharmacology and toxicology.** Japanese Journal of Forensic Toxicology 2005;23(3):187. [Editor's Notes: An overview and brief review. Includes analytical methods. Focus is toxicological. This article is written in Japanese. Contact: Department of Legal Medicine, Graduate School of Comprehensive Human Sciences, University of Tsukuba, Ibaraki-ken 305-8575, Japan.]

\* \* \* \* \*

## THE JOURNAL/TEXTBOOK COLLECTION EXCHANGE

The Journal/Textbook Collection Exchange is a service intended to facilitate the transfer of unwanted journals and textbooks to forensic libraries or other subscribers. At present, this service is offered once a quarter (in January, April, July, and October). The most current items are listed on the next page. The offers are First Come/First Serve (except libraries have preference). There are no charges to the requestor. Provide full mailing address in request.

**Important!:** Do not provide an address that irradiates mail!

- \* The *Journal of Forensic Sciences*:  
     2003 - January (#1).  
     2004 - March (#2), July (#4), and November (#6).  
     2005 - Entire year (#'s 1-6), plus January (#1), May (#3), July (#4), and November (#6).
- \* Physician's Desk Reference, 48th Edition (1994).
- \* Physician's Desk Reference, 51st Edition (1997).
- \* Physician's Desk Reference, 59th Edition (2005).

**All subscribers are encouraged to donate surplus or unwanted items/collections.** Reference texts and long runs of forensic/analytical journals are of particular interest; however, even single issues are worthwhile. If interested, please consult the *Microgram* website or contact the *Microgram* Editor for further instructions.

The next offering of journals and textbooks will be in the July 2006 issue of *Microgram Bulletin*.

\* \* \* \* \*

## THE DEA FY - 2006 STATE AND LOCAL FORENSIC CHEMISTS SEMINAR SCHEDULE

The remaining FY - 2006 schedule for the DEA's State and Local Forensic Chemists Seminar is as follows:

May 8 - 12, 2006  
 July 10 - 14, 2006  
 September 11 - 15, 2006

Note that the school is open only to forensic chemists working for law enforcement agencies, and is intended for chemists who have completed their agency's internal training program and have also been working on the bench for at least one year. There is no tuition charge for this course. The course is held at the AmeriSuites Hotel in Sterling, Virginia (near the Washington/Dulles International Airport). A copy of the application form is reproduced on the last page of the August 2004 issue of *Microgram Bulletin*. Completed applications should be mailed to the Special Testing and Research Laboratory (Attention: P. Smith or J. Kerlavage) at: 22624 Dulles Summit Court, Dulles, VA 20166. For additional information, call 703/668-3337.

\* \* \* \* \*

The establishment of a comprehensive and effective in-house training program is crucial to the operation and success of any digital forensics program. With the ever-increasing advances in digital technology, it is important to have a program that will keep your organization current. While several commercial vendors provide all types and levels of digital forensics training, it is worthwhile to consider the benefits of an in-house training program. For example, increased flexibility in providing organization-specific training, such as evidence vault procedures, documentation and reporting requirements, distinctive processing methodologies, and so on. Other benefits include the use of the equipment and software that has already been installed and validated at your facility, focusing on legal issues that are critical to your agency's mission, providing moot court training that is specific for your type of casework (and that can be readily observed by management and/or critiqued by agency experts), and so on. Moreover, non-digital forensic training can also be added, such as organization history and structure, laboratory safety and security, equal employment opportunity, and other required agency-specific topics.

Training programs should be designed and administered at three distinct levels, those being basic, advanced, and skill maintenance. As implied above, the training can be conducted most conveniently by in-house personnel - which provides opportunities for other examiners to share their knowledge and expertise. Training can also be provided by external sources, or by a combination of in-house personnel and external sources. Additionally, the program should incorporate at least two levels of testing, those being initial qualification and proficiency. Initial qualification testing, which is normally completed at the conclusion of basic training, verifies and documents the examiner's understanding of the basic information and training. Proficiency testing, which is normally conducted annually, verifies and documents the continued understanding of digital forensics and compliance with established organizational policies and procedures.

Basic level training provides both novice and experienced practitioners with the fundamentals of how to properly conduct effective digital forensic examinations in accordance with your agency's specifications. This is the most important level of instruction, as it establishes the foundation on which an examiner's career depends. It can include a wide variety of topics, such as organizational history and structure, ethics, standard operating procedures, legal issues, documentation, evidence handling, and forensic processes. In contrast, advanced level training provides experienced practitioners with opportunities to expand and/or enhance their digital forensic examination skills. Advanced training is typically taught by external providers, and usually focuses on one specific topic, such as date/time stamp analysis, Internet history processing, and steganography. However, it can also be taught by qualified in-house personnel who have specialized expertise, for example SQL database or Exchange Server processing. Finally, the maintenance level should be designed to provide examiners with opportunities to maintain their digital forensic examination skills. It can include basic and advanced topics and/or "refresher" training, and can be taught by either qualified in-house personnel or external providers.

The three training levels will be discussed in more detail in "Part 2" of this series.

Questions or comments? E-mail: [Clayton.D.Schilling-usdoj.gov](mailto:Clayton.D.Schilling-usdoj.gov)

# Microgram

## *Bulletin*

**Published by:**

The Drug Enforcement Administration  
Office of Forensic Sciences  
Washington, DC 20537

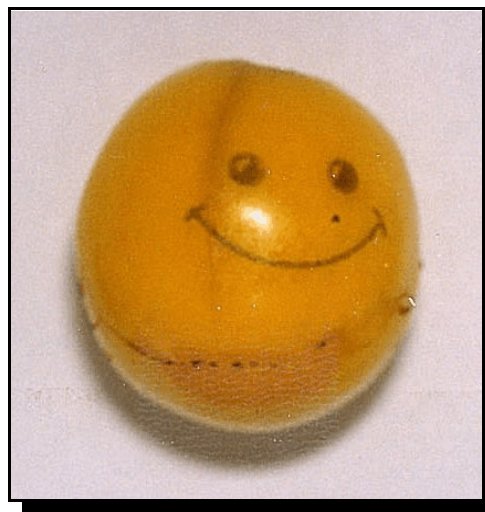
The U.S. Attorney General has determined that the publication of this periodical is necessary in the transaction of the public business required by the Department of Justice. Information, instructions, and disclaimers are published in the January issues.

- MAY 2006 -

**- INTELLIGENCE ALERT -**

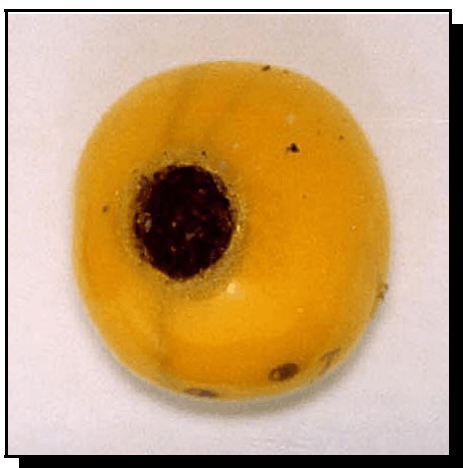
**“GREENADES” (MARIJUANA GUMBALLS) IN HOWARD COUNTY, MARYLAND**

The Maryland State Police-Forensic Sciences Division Laboratory in Pikesville recently received two yellow gumballs, each with a smiley face printed on one side and a bored hole filled with greenish-brown vegetable matter on the opposite side (see Photos 1, right, and Photo 2, next page). Both gumballs were wrapped in tin foil labeled as “Greenades” with a marijuana leaf and detailed instructions for use (see Photo 3, next page). The exhibits were seized by a school-assigned Police Officer from two high school students performing a purchase while they were passing between classes at a Howard County (Maryland) High School. Analysis of the plant material by microscopy, GC, GC/MS, Mayer’s, and modified Duquenois-Levine confirmed marijuana (THC content not quantitated). Each gumball contained approximately one gram of marijuana, and the total net mass of the two gumballs was 17.5 grams. This was the first submission of “Greenades” to the Maryland State Police-Forensic Sciences Division.



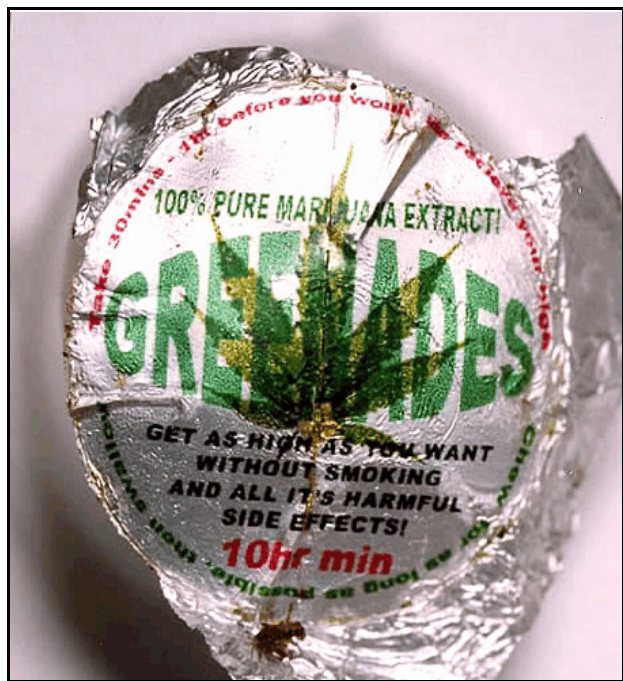
**Photo 1**





**Photo 2**

[Notes: The perimeter of the label includes instructions: "Take 30mins -1 hr before you would like receive your high" (and) "Chew for as long as possible, then swallow." Gumball diameter = About 1 inch.]



**Photo 3**

\* \* \* \* \*

**- INTELLIGENCE ALERT -**

**ECSTASY COMBINATION TABLETS (CONTAINING MDMA, KETAMINE, METHAMPHETAMINE, AND COCAINE) IN EAST BRUNSWICK, NEW JERSEY**

The New Jersey State Police East Regional Laboratory (Sea Girt) recently received ten white tablets with a "Motorola" logo, suspected MDMA (see Photo 4). The tablets were acquired in East Brunswick by a detective from the Middlesex County Prosecutor's Office (circumstances unavailable). Analyses of the tablets (total net mass 2.79 grams) by color testing, GC/MS and GC/MS following derivatization indicated not only MDMA but rather a complex mixture of MDMA, ketamine, methamphetamine, cocaine, and possibly diphenhydramine (in approximately a 68 : 24 : 3.5 : 3.5 : 1 ratio). Interestingly, the Marquis color test suggested a complex mixture by changing from flash orange to yellow to dark purple/black. This was the first submission of tablets containing this combination to the laboratory.



**Photo 4**

**- INTELLIGENCE ALERT -**

**LSD BLOTTER ACID MIMICS (CONTAINING 4-iodo-2,5-DIMETHOXY-AMPHETAMINE (DOI)) IN ORLANDO AND WINTER SPRINGS, FLORIDA**

The Florida Department of Law Enforcement's Orlando Regional Crime Laboratory recently received two separate submissions of apparent LSD "blotter acid," consisting of full sheets, pieces, and individual squares of a green index card-like paper with hash marks (photos not available). The exhibits were seized in Orlando and Winter Springs by their respective Police Departments (circumstances not available). Analysis of methanolic extracts by GC/MS, however, indicated not LSD but rather 4-iodo-2,5-dimethoxyamphetamine (DOI, not confirmed or quantitated due to lack of a reference standard). These were the first submissions of DOI in our laboratory.

[Editor's Notes: DOI is the amphetamine analogue of 2C-I (4-iodo-2,5-dimethoxyphenethylamine). According to the analyst, although not formally quantitated, the loading of DOI on the paper was "moderate". The analyst also indicated that the laboratory has not seen LSD blotter acid mimics in some time.]

\* \* \* \* \*

**- INTELLIGENCE ALERT -**

**BLACK TAR HEROIN SMUGGLED  
INSIDE A TEDDY BEAR  
IN EAST BATON ROUGE, LOUISIANA**

The Louisiana State Police Crime Laboratory at Baton Rouge recently received ten small packages containing a dark tar-like substance, suspected black tar heroin (see Photo 5). The exhibits were seized in East Baton Rouge by the East Baton Rouge Parish Sheriff's Office, pursuant to a vehicle stop by the U.S. Border Patrol. All ten packages were hidden inside a teddy bear, which in turn was inside luggage in the vehicle. Each packet of the tar-like material was first wrapped in clear plastic, which was then wrapped in black tape. Analysis of the material (total net mass 222.50 grams) by GC/MS confirmed heroin (not quantitated, but only a moderate percentage based on the GC chromatogram). Black tar heroin is not routinely submitted to the laboratory, and this is also the laboratory's first encounter with the use of a teddy bear for smuggling a controlled substance.

[Editor's Note: The tenth package was opened for field testing, and subsequently leaked into the evidence envelope (as seen in Photo 5).]

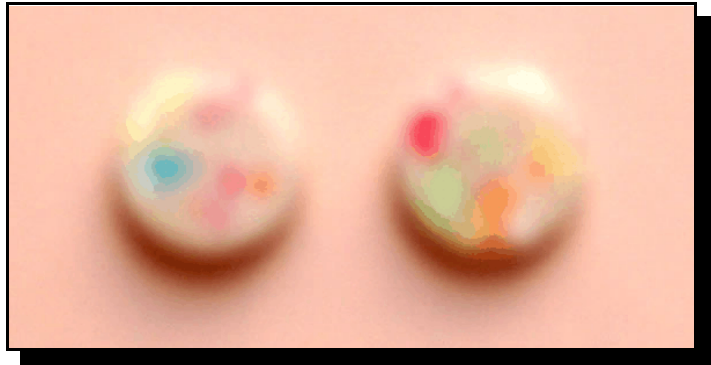


**Photo 5**

**- INTELLIGENCE ALERT -**

**ECSTASY MIMIC TABLETS (CONTAINING META-CHLOROPHENYL-PIPERAZINE (mCPP)) IN THE BALEARIC ISLANDS**

During 2005 the Laboratory of Drugs in The Balearic Islands (Spain) analyzed 17 separate submissions of apparent Ecstasy tablets (two different types) that did not contain MDMA but rather 1-(3-chlorophenyl)-piperazine (aka: *meta*-chlorophenylpiperazine, mCPP). All of them were seized by the Guardia Civil on Ibiza Island. One set (83 tablets total) was mottled blue, red, orange, and green, no logo, varying from 111 to 357 milligrams per tablet (total net mass 25.05 grams) (see Photo



**Photo 6**

6; note that this is the best available photo). The other set (298 tablets) was white, no logo, averaging 300 milligrams per tablet (total mass 89.35 grams) (photo not provided). The only common feature among the various sets of tablets was their notably poor manufacturing quality. Analyses were performed using GC-FID, GC/MS, and NMR (quantitations not performed due to lack of reference material). These were the first submissions of Ecstasy mimic tablets containing mCPP to the laboratory.

\* \* \* \* \*

**- INTELLIGENCE ALERT -**

**METHAMPHETAMINE CUT WITH UREA BEING ENCOUNTERED IN THE WESTERN UNITED STATES AND ALASKA**

The DEA Western Laboratory (San Francisco, California) recently received an off-white crystalline substance wrapped in a clear plastic baggie, suspected methamphetamine (no photo). The exhibit was acquired in West Valley City, Utah, by agents from the DEA Salt Lake City Office (circumstances unavailable). Analysis of the substance (total net mass not provided) by FTIR, GC/MS, and NMR confirmed 13 percent methamphetamine hydrochloride, dimethyl sulfone, and urea. This is at least the seventh submission of methamphetamine samples cut with urea to the DEA Western Laboratory. Similar samples have been submitted over the past few months from Murray City, American Fork, and Layton, Utah, Anchorage, Alaska, Mount Vernon, Washington, and most recently from San Francisco, California. It is quickly becoming a more common trend.

[Analyst's Comments: The presence of urea in methamphetamine is of interest because the compound is not easily detected on GC/FID or GC/MS (it is sometimes observed as a low hill near the baseline, with only a few low mass fragments). In the above case, urea was identified in the methylene chloride insolubles by FTIR and NMR. Of further interest, urea does not interfere with either the Marquis or sodium nitroprusside color tests.]



**- INTELLIGENCE ALERT -**

**COCAINE CONCEALED WITHIN THE WALLS OF A COOLER  
ARRIVING AT DULLES INTERNATIONAL AIRPORT**

The DEA Mid-Atlantic Laboratory (Largo, Maryland) recently received a red cooler containing four plastic bags of white powder, suspected cocaine (see Photos 7 and 8). The cooler was seized by Immigration and Customs Enforcement (ICE) personnel at Dulles International Airport, Virginia, from a duffel bag found in the cargo area of a flight from San Salvador, El Salvador, that had transited through Atlanta, Georgia. The cooler (approximately 10 x 8 x 6 inches) was empty and otherwise normal in appearance. The bags of powder were wrapped in layers of foil, tape, and mustard, and were concealed between the outer and inner walls of the cooler. Analysis of the powder (total net mass 411.7 grams) by GC/FID, GC/MS, and FTIR-ATR confirmed 85 percent cocaine hydrochloride. This is the second such recent submission to the Mid-Atlantic Laboratory.



**Photo 7**



**Photo 8**

\* \* \* \* \*

**- INTELLIGENCE ALERT -**

**MOROXYDINE HYDROCHLORIDE FOUND IN A HEROIN EXHIBIT FROM LAOS**

The DEA Special Testing and Research Laboratory (Dulles, Virginia) recently received an off-white granular substance submitted to the laboratory for analysis from the DEA Country Office in Vientiane, Laos, suspected morphine. The substance was seized by Laotian authorities in an undisclosed area of Laos. Analysis of the substance (total net mass 6.8 grams) by GC/MS, CE, and proton-NMR, however, indicated not morphine but rather 23 percent heroin (calculated as the hydrochloride), along with 26 percent caffeine, 7 percent acetaminophen, 7 percent

O6-monoacetylmorphine (also calculated as the hydrochloride), and an unknown compound. The unknown was detected by CE and NMR, but not by GC/FID or GC/MS (either directly or following MSTFA derivatization). Further analysis of the chloroform insolubles (containing the unknown) by FTIR, LC/MS/MS, and advanced 1- and 2-dimensional NMR techniques indicated 20 percent moroxydine HCl (see Figure 1), an antiviral medicine. This substance does not appear to be used in the United States, but it is commercially available in many other areas of the world. It is unclear why it would be utilized as a heroin adulterant. This is the first submission of a sample containing this unusual adulterant to the Special Testing and Research Laboratory.

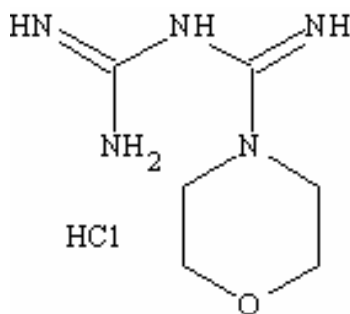


Figure 1 – Structure of Moroxydine Hydrochloride.

\* \* \* \* \*

**- SPECIAL INTELLIGENCE BRIEF -**

**“CHEESE”**

Officer Jeremy Liebke  
Forensics and Evidence  
Dallas ISD Police Department  
1402 Seegar  
Dallas, TX 75215

[Taken in Part from the Narcotics Information Bulletin of the Same Title;  
Unclassified; Reprinted with Permission.]

Between August 15, 2005, and March 1, 2006, the Dallas Independent School District Police Department handled 54 felony offenses and 24 found property cases involving a new drug mixture known on the street as “Cheese,” a so-called “starter form” of heroin. “Cheese” is typically found folded inside a small paper bindle, and in the Dallas area is popular among Hispanic juveniles, both male and female, with known users as young as 13 years old. It is typically encountered as a light tan colored powder with granules varying from fine powder to 1.5 millimeters in size (see Photo 9). It is administered by insufflating (snorting) the powder into the nose through a tube, much in the same fashion as



**Photo 9**

is practiced with cocaine. Users have described the effects as causing euphoria, disorientation, lethargy, sleepiness, and hunger. As with any form of heroin, "Cheese" appears to be highly addictive, and withdrawal symptoms may onset as fast as within 12 hours of cessation of use.

Analysis of "Cheese" samples shows that it contains acetaminophen, diphenhydramine hydrochloride, and up to 8 percent heroin. Due to chemical interference caused by the acetaminophen and diphenhydramine hydrochloride, forensic analysis of "Cheese" can be challenging. It is believed that "Cheese" is manufactured by mixing a small quantity of heroin with a large quantity of crushed Tylenol-PM® caplets (that is, a commonly available formulation of acetaminophen and diphenhydramine hydrochloride).

\* \* \* \* \*

### **- SPECIAL INTELLIGENCE AND SAFETY ALERT -**

#### **WIDESPREAD FENTANYL-RELATED OVERDOSES AND DEATHS IN THE NORTHEASTERN AND UPPER MID-EASTERN UNITED STATES !**

Over the past year, law enforcement encounters with illicitly manufactured fentanyl have dramatically increased. Two clandestine fentanyl laboratories, a kilogram package of high purity fentanyl hydrochloride, a variety of fentanyl containing tablets (both Ecstasy-type mimics and Oxycontin® counterfeits), various mixtures of heroin/fentanyl powders, and at least one cocaine/fentanyl powder, have been seized from locations throughout the United States. Of particular concern, the distribution of heroin/fentanyl powders in and nearby the Chicago and Philadelphia metropolitan areas starting in February 2006 has (as of mid-May) resulted in several hundred overdoses and about fifty deaths, with additional overdoses and deaths being reported daily.

Fentanyl is a Schedule II Controlled Substance, classified as a narcotic analgesic (opiate). It is medically used both for acute and chronic pain control. It is also abused, usually as a substitute for heroin. Various pharmacological studies estimate fentanyl to be 30 to 50 times more potent than heroin (thus explaining the large numbers of overdoses and deaths associated with its abuse). The most common adverse effect is respiratory suppression - that is, the victim simply stops breathing.

All law enforcement personnel, including forensic and crime laboratory personnel, along with medical emergency response personnel, hospital emergency room personnel, toxicologists, pathologists, and similar, should be well aware of this still ongoing situation. Anyone who believes they have been exposed to fentanyl-containing materials, or who is experiencing fentanyl-overdose-like symptoms such as disorientation and respiratory distress, should seek immediate medical attention. In addition, any samples of known or suspected fentanyl-containing materials should be handled with appropriate care, and prominently labeled so that personnel along the chain of custody are aware of their unusually hazardous character.

\* \* \* \* \*



# Request for Information on the Illicit Manufacture of Fentanyl

## - Potential Control of Fentanyl Precursors Being Considered -

The Drug Enforcement Administration (DEA) is concerned with the recent increase in the illicit manufacture and distribution of fentanyl, and in the large numbers of overdoses and deaths associated with its abuse. In response to this situation, the DEA's Drug and Chemical Evaluation Section (ODE) is considering controlling fentanyl's precursor chemicals. Therefore, ODE is interested in obtaining information on all seizures of illicitly manufactured fentanyl that have occurred within the past four years, as well as all future seizures through the end of CY-2007, in order to document the extent of this problem. This request is specifically looking for information concerning the synthetic route used by the clandestine laboratory to manufacture fentanyl. Furthermore, in order to document the impact on public health, ODE is requesting data on the number of overdoses, and overdose deaths attributed to illicitly manufactured fentanyl only (that is, not from legitimately manufactured fentanyl patches or from pharmaceutical grade fentanyl citrate, both of which are occasionally diverted and abused).

**Primary Fentanyl Synthesis Routes:** In 1965, Janssen Pharmaceutica patented the original synthesis for fentanyl, which used N-benzyl-4-piperidone as the starting material. The Janssen synthesis is challenging, and is beyond the rudimentary skills of most illicit chemists; however, it has been used in a number of settings by illicit chemists with advanced technical training. In the early 1980s, an alternate fentanyl synthesis route was published in the scientific literature, that used N-phenethyl-4-piperidone (NPP) as the initial starting material. The NPP synthesis route has been independently tested and verified (Noggle FT, Andurkar SV, Clark CR, DeRuiter J. GC-MS analysis of fentanyl synthesized from 1-phenethyl-4-piperidone. Microgram 1993;26(12):285).<sup>\*</sup> This latter route has also been utilized in a number of clandestine laboratories.

**Identification of Fentanyl Synthesis Route:** The synthesis route used to manufacture illicit fentanyl can be determined by the identification of "marker" contaminants in the seized material. The presence of benzylfentanyl (a.k.a. N-(1-benzyl-4-piperidyl)-N-phenylpropanamide) suggests that the original Janssen synthesis route was used. Using GC/MS, benzylfentanyl can be presumptively identified by matching the four primary mass fragments (at  $m/z$  = 82, 91, 146, and 173) in its mass spectrum (see spectrum, Page 61). If present, the peak for benzylfentanyl will have a relative retention time (RRT) of about 0.963 to that of fentanyl (note that this will vary dependent on the type of capillary column and GC temperature program that are used).

In contrast, the presence of the immediate precursor 4-anilino-N-phenethyl-piperidine (ANPP) suggests that the NPP synthesis route was used. Using GC/MS, ANPP can be presumptively identified by matching the three primary mass fragments (at  $m/z$  = 146, 189, and 280) in its mass spectrum (see spectrum, Page 62). If present, the peak for ANPP will have a relative retention time (RRT) of about 0.891 to that of fentanyl (again, this will vary dependent on the type of capillary column and GC temperature program that are used).

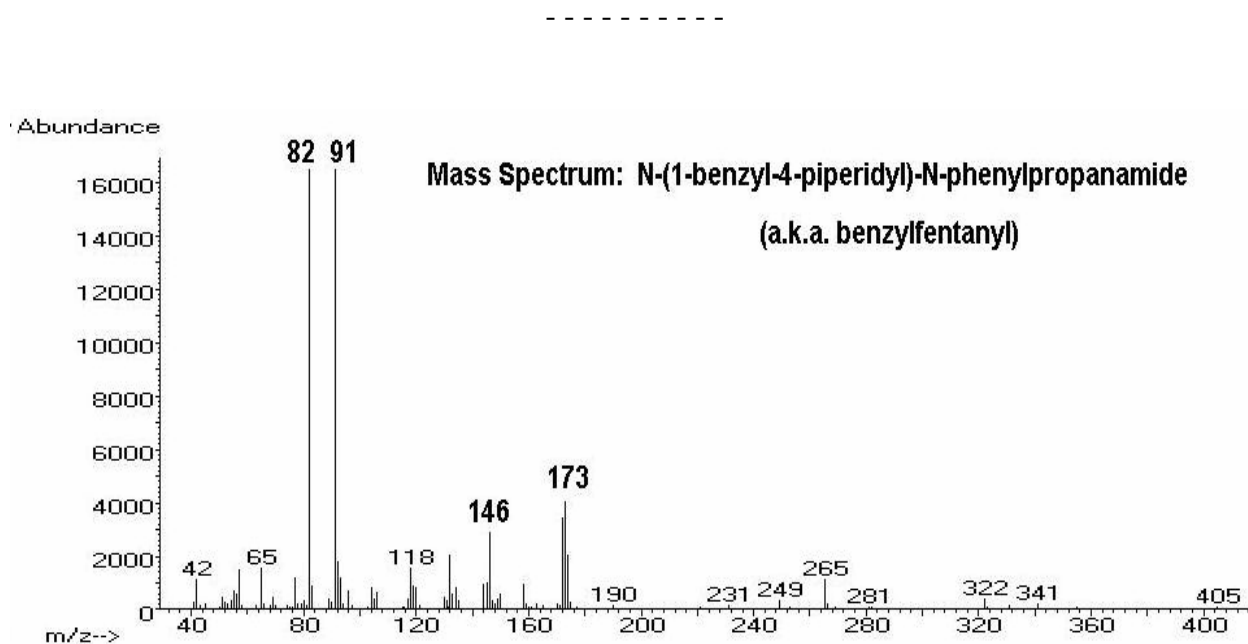
**Request for Information:** Unfortunately, the information in the pertinent law enforcement databases on fentanyl seizures only rarely includes the determination of the synthetic route. Therefore, ODE is directly soliciting information from all federal, state, and local agencies and

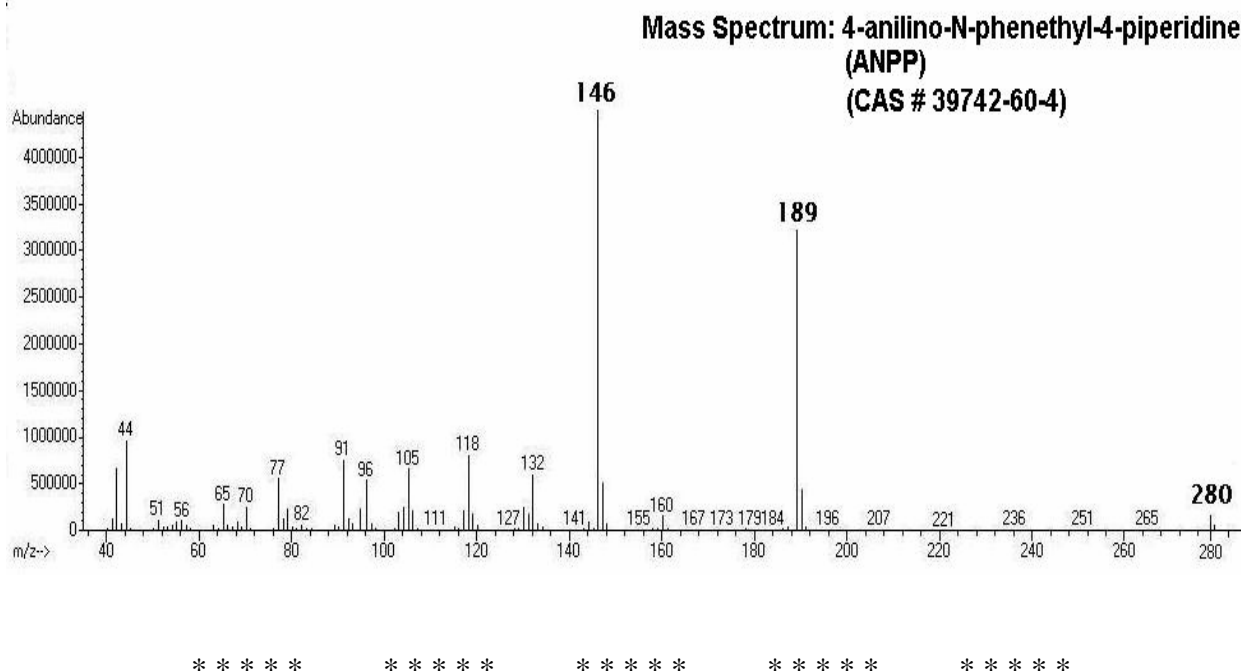
offices (law enforcement, forensic and crime laboratories, toxicology laboratories, coroner's offices, medical examiners, etc.) to document the presence or absence of the contaminants ANPP or benzylfentanyl in fentanyl seizures that have occurred within the past four years, as well as all future seizures through the end of CY 2007. ODE is specifically requesting the documentation of all occurrences of illicitly manufactured fentanyl (again, not from pharmaceutical sources), the synthesis route used (e.g., as determined from the presence of "marker" compounds), and the number of known overdoses and overdose deaths cause by illicitly manufactured fentanyl, if known.

Please note that ODE is not requesting re-analyses of closed case exhibits; rather, it is requested that the data in the pertinent case file(s) be reviewed with an eye towards identifying the referenced "marker" compounds. And that the analyses of all future submissions of fentanyl-containing exhibits be conducted with an eye towards specifically looking for the referenced "marker" compounds.

All information should be provided to: Mr. Wilson, Drug Science Specialist: Office: (202) 307-7183; Office Fax: (202) 353-1263; or Office Address: Attn: Mr. Wilson, Drug Enforcement Administration, Drug and Chemical Evaluation Section (ODE), Washington, DC 20537.

[\* All issues of *Microgram* prior to January 2003 are Law Enforcement Restricted.]





## SELECTED REFERENCES

[Selected references are a compilation of recent publications of presumed interest to forensic chemists. Unless otherwise stated, all listed citations are published in English. Listed mailing address information exactly duplicates that provided by the abstracting service. Patents and Proceedings are reported only by their *Chemical Abstracts* citation number.]

1. Dahlen J, von Eckardstein S. **Development of a capillary zone electrophoresis method including a factorial design and simplex optimisation for analysis of amphetamine, amphetamine analogues, cocaine, and heroin.** *Forensic Science International* 2006;157(2-3):93. [Editor's Notes: Amphetamine and 13 analogues (not specified in the abstract) were analyzed, and the method was successfully applied to street samples. Contact: Swedish National Laboratory of Forensic Sciences - SKL, Linköping SE-581 94, Swed.]
2. Haroz R, Greenberg MI. **Emerging drugs of abuse.** *Medical Clinics of North America* 2005;89(6):1259. [Editor's Notes: A review of non-traditional drugs, including analogues, plants, and diverted pharmaceuticals. Contact: Department of Emergency Medicine, Medical College of Pennsylvania Hospital, Drexel University College of Medicine, Philadelphia, PA (zip code not provided).]
3. Shen J, Sun J, Li N, Liang L, Xu X, Liu H, Zhang C. **Investigation on THz fingerprint spectrum of illicit drugs.** (Proceedings) *Chemical Abstracts* 2006;144:186167e.
4. Tagliaro F, Bortolotti F. **Recent advances in the applications of CE to forensic sciences (2001-2004).** *Electrophoresis* 2006;27(1):231. [Editor's Notes: A minor overview and review. The first section includes illicit drugs. Contact: Department of Public Medicine and Health, Section of Forensic Medicine, University of Verona, Verona, Italy.]
5. Zhang S. **Kit for combined detection of drugs, its preparation method and blocking agents used for the same.** (Patent) *Chemical Abstracts* 2006;144:144626y.

## Additional References of Possible Interest:

1. Below E, Rosenstock S, Lignitz E. **Hemp products in the German food market place. THC content and forensic meaning.** Blutalkohol 2005;42(6):442. [Editor's Notes: Debunks the common legal defense ploy (in Germany) that use of hemp-based consumer products caused a positive drug test for cannabis or hashish. This article is written in German. Contact: Insitut fuer Rechtsmedizin, Ernst-Moritz-Arndt Universitaet, Greifswald D-17487, Germany.]
2. Duyndam A. **XTC: The game and marbles.** Chemisch2Weekblad 2005;101(11):20. [Editor's Notes: A brief overview of illicit MDMA laboratories in the Netherlands (abstract indicates forensic chemistry). This article is written in Dutch. Contact: Neth. (no other contact information was provided).]
3. Lachenmeier DW, Emmert J, Kuballa T, Sartor G. **Thujone - Cause of absinthism?** Forensic Science International 2006;158(1):1. [Editor's Notes: Includes analytical studies of current and vintage absinthes, and also of absinthe prepared (by the authors) using historical recipes; the authors conclude that reported historical levels of thujone in absinthe cannot be confirmed, and also that the low levels of thujone found in absinthe is not responsible for "absinthism". Contact: Chemisches und Veterinaeruntersuchungsamt (CVUA) Karlsruhe, Weissenburger Str. 3, Karlsruhe D-76187, Germany.]
4. Sakayanagi M, Yamada Y, Sakabe C, Watanabe K, Harigaya Y. **Identification of inorganic anions by gas chromatography/mass spectrometry.** Forensic Science International 2006;157(2-3):134. [Editor's Notes: Uses derivatization with pentafluorobenzyl-p-toluene sulfonate and a crown ether as a phase transfer catalyst; 10 anions could be analyzed down to the 30 ng level. Contact: Kanagawa Prefectural Police Headquarters, Scientific Criminal Investigation Laboratory, 155-1 Yamashita-Cho, Naka-Ku, Yokohama 231-0023, Japan.]

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## SCIENTIFIC MEETINGS

### 1. Title: 32nd Annual NEAFS Meeting

(First Bimonthly Posting)

**Sponsoring Organization:** Northeastern Association of Forensic Sciences

**Inclusive Dates:** November 1 - 4, 2006

**Location:** Tarrytown DoubleTree Hotel (Westchester County, New York)

**Contact Information:** E. Schwartz (914 / 231-1810 or ess6-at- westchestergov.com)

**Website:** None Provided

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### 2. Title: 16th Annual CLIC Technical Training Seminar

(First Posting)

**Sponsoring Organization:** Clandestine Laboratory Investigating Chemists Association

**Inclusive Dates:** September 6 - 9, 2006

**Location:** Hong Omni Mont-Royal Hotel (Montreal, Quebec, Canada)

**Contact Information:** See O.C. Anderson (620 / 792-4353 or carl.anderson -at- kbi.state.ks.us)

**Website:** None Provided

\* \* \* \* \*

Part I of this series (Computer Corner #205) addressed the establishment of a comprehensive and effective in-house training program that is designed and administered at three distinct levels, those being: Basic, Advanced, and Skill Maintenance. This article will concentrate primarily on the details of Basic Training.

### Basic Training

Entry level training should be designed to educate both novice and experienced practitioners in the fundamentals of conducting effective digital forensic examinations in accordance with your agency's specifications. The digital forensics field is extremely broad, and examination requirements can vary tremendously between agencies. It is therefore very important to establish a program that will train all new employees, regardless of their skill levels upon arrival. For a new practitioner, or for those that have only beginner-level knowledge and skills, the program should comprehensively cover the skills needed to establish a solid foundation. For already experienced practitioners, entry-level training programs are often rather boring - but it is still necessary for them to participate, so they understand the agency's specific requirements.

Providing an outline for each training topic or module is paramount to the basic program's success. This outline should include an overview or introduction, a list of objectives, the number of lecture, lab, and practical exercise hours, a list of handouts and/or references that will be used, and a summary of each of the discussion topics that will be addressed.

The overview or introduction paragraph is a summary of what the training will consist of, and should help the student understand what is being taught. The objectives list identifies measurable goals within the topic that lets the student know what specific knowledge, skills, and abilities they should understand or have mastered at each level. The individual objectives should be formally measurable by successful completion of either a specific task or a test. The number of lecture, lab, and practical exercise hours typically required to complete each area in the topic should be specified (lecture hours cover the amount of time spent teaching the information, lab hours cover the time spent performing the hands-on portions of the training, and the practical exercise hours cover the time spent on testing). This information can be summarized using a simple, two-rowed, four columned table containing column headings and total hours typically needed for each topic or subtopic (e.g., see below). The last column should contain a total of all the hours required for the topic.

Lecture	Lab	Practical Exercise	Total
2	2	2	6

The handouts and/or references list is self-explanatory. The discussion topics summary identifies the step-by-step method(s) by which the training will be conducted. Typically, this paragraph is a bulleted listing of subtopics that follow a logical progression in leading the

student from A to Z in the primary topic. It should be detailed enough that any instructor could use it to conduct the class, and also enable the student to answer or clarify any future questions.

A verbal overview is an excellent means to introduce a training program to the student(s). The purpose of the program can be explained (that is, that the training is designed to provide the student(s) with the skills needed to conduct digital forensics examinations in accordance with established organizational policies and procedures, which are consistent with industry standards). Additionally, an explanation of how the training will be conducted can be provided (for example, in a lecture format, supplemented with hands-on activities and practical exercises). The testing methods and standards should also be detailed, and should specify both the passing requirements (e.g., a minimum numeric score for written tests and a "pass/fail" score for practical exercises) and the failing consequences (e.g., re-training and re-testing) for all administered tests and practical exercises, to include the final written test and hands-on practical. "Final" consequences should also be specified; that is, if a passing grade is still not achieved after re-training, the student will be removed from the program, reassigned to another area, or released from employment.

In addition to the core skills, what other topics should your training program cover? As was discussed in Part I, it can (and should) include a wide variety of topics, such as organizational history and structure, ethics, standard operating procedures, legal issues, documentation, evidence handling, forensic processes, and so on.

The organizational history and structure training helps the students understand the importance of their role in your agency's mission. The policies and procedures training identify the guiding protocols by which your agency operates, and the methodologies each examiner should use in performing their job. The quality assurance training should address topics such as examiner proficiency testing, re-analysis and peer review, analytical inconsistencies, and so on. The ethics training should cover your agency's ethics policies as well as related legal issues such as *Giglio v. United States*, 405 U.S. 150 (1972).

Other important topics include legal issues, evidence handling, and examination documentation. Various legal precedents that are specifically pertinent to digital evidence, such as the Fourth Amendment (search and seizure issues), the Federal Rules of Evidence ("best evidence" issues), the Electronic Communications Privacy Act (ECPA), and Frye/Daubert issues (*Frye v. United States*, 293 F. 1013 (D.C. Cir. 1923) and *Daubert v. Merrell Dow Pharmaceuticals*, 509 U.S. 579 (1993)), to name a few, should be covered in great detail. It is critically important for examiners to understand how the law affects their work. Moot Court training, which will expose the examiner to the court system and expert witness testimony, should also be included. Examination documentation (that is, case file organization and management, comprehensive note taking, and report writing) is another organization-specific topic that should be covered.

As mentioned earlier, the topic of digital forensics is extremely broad and the examination requirements can vary tremendously between agencies. The following is a sample listing of the types of forensic-specific training that could be incorporated into a basic training program:

- \* Digital forensics using open source and industry standard forensic software
- \* Linux/Unix and Macintosh computer forensics (overview)
- \* Cell phone and PDA forensics



- \* Wiping hard drives and other media
- \* Forensic platform preparation and control checks
- \* Imaging and archiving of magnetic and optical media
- \* Operating Systems - Microsoft Windows, Linux, Unix, etc. (overview)
- \* Recovering - Swap files/Temporary files/Cache files/Deleted files
- \* Carving unallocated disk space and file slack
- \* Password cracking

### **Advanced/In-Service Training**

Advanced Training is designed to provide examiners with opportunities to improve their digital forensic skills. In most cases, this training is taught by external providers, and usually focuses on just one or two specific topics, e.g., date/time stamp analysis, Internet history processing, or Steganography. However, it can also be taught by qualified in-house personnel if the agency is looking to share specific, higher-level knowledge that a certain examiner possesses, e.g., SQL database or Exchange Server processing.

### **Skill Maintenance Training**

Skill Maintenance Training should be designed to provide examiners with opportunities to improve and/or maintain their digital forensic skills. This training is usually completed in-house and provides an excellent opportunity for an agency to share knowledge and skills between examiners.

Questions or comments? E-mail: [Clayton.D.Schilling -at- usdoj.gov](mailto:Clayton.D.Schilling-usdoj.gov)

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# Microgram

## *Bulletin*

**Published by:**

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The U.S. Attorney General has determined that the publication of this periodical is necessary in the transaction of the public business required by the Department of Justice. Information, instructions, and disclaimers are published in the January issues.

- JUNE 2006 -

**- INTELLIGENCE ALERT -**

**FENTANYL SOLD AS COCAINE IN LAKE COUNTY, OHIO**

The Lake County Crime Laboratory (Painesville, Ohio) recently received a plastic baggie containing an inhomogeneous white powder, suspected to be cocaine but later alleged by the suspect to possibly be crushed Vicodin® (see Photo 1). The exhibit was seized by a Lake County Deputy Sheriff from the floor of a gas station restroom in Painesville, where the male subject had been discovered unresponsive and struggling to breathe (subsequent investigation revealed that he was a cocaine addict and was in a drug rehab program). Analysis of the homogenized powder (total net mass 0.71 grams) by GC/MS and FTIR, however, indicated not cocaine or hydrocodone (i.e., Vicodin®) but rather 23 percent fentanyl, 0.7 percent despropionyl fentanyl, trace (0.1 percent) cocaine, and 62 percent mannitol. This was the first such submission to the Lake County Crime Laboratory.



**Photo 1**

[Editor's Notes: Although there have been multiple anecdotal reports of cocaine/fentanyl mixtures during the ongoing epidemic of heroin/fentanyl-related overdoses and deaths, this is the

first such case reported to *Microgram Bulletin*. However, the analyst suspects that the trace cocaine in the exhibit may actually have been the result of contamination either from reuse of the plastic baggie, or by the distributor during formulation (i.e., it was not intended to be a cocaine/fentanyl mixture). No information was available as to the source of the material. Creatine monohydrate and Seroquel® (a prescription antipsychotic) were also seized from the subject's vehicle. The percent fentanyl in this case (23 percent) was extraordinarily high for a "street sample"; however, due to early discovery and rapid emergency response, the subject survived.]

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## **- INTELLIGENCE ALERT -**

### **HIGH PURITY FENTANYL SEIZED NEAR WESTMORELAND, CALIFORNIA**

The DEA Southwest Laboratory (Vista, California) recently received a multi-exhibit submission consisting of: A) 31 packages of an off-white crystalline material wrapped in brown tape and multiple layers of plastic and grease, suspected methamphetamine; B) a plastic container that also contained the same off-white crystalline material, also suspected methamphetamine; C) a clear plastic ziplock bag containing a loose white powder, suspected cocaine; and D) a package containing a semi-compressed white material wrapped in layers of plastic and brown tape, also suspected cocaine (see Photo 2 for the two suspected cocaine exhibits).



**Photo 2 (Case Information Obscured)**

The exhibits were seized by U.S. Border Patrol Agents from a vehicle transiting the California Highway 86 checkpoint north of Westmoreland, California. Analysis of the suspected methamphetamine exhibits (total net mass 13.85 kilograms) by GC, ATR, GC/MS, and LC confirmed 95 percent d-methamphetamine hydrochloride. Analysis of the suspected cocaine exhibits (total net mass 945.1 grams) by GC, ATR, GC/MS, and LC, however, indicated not cocaine but rather 83 percent fentanyl hydrochloride. The immediate precursor 4-anilino-N-phenethylpiperidine (ANPP) was also identified in the sample (quantitation not reported). The Southwest Laboratory has analyzed numerous fentanyl-containing and related exhibits from two clandestine laboratories recently seized in southern California; however, these exhibits are believed to have originated in Mexico.

[Editor's Notes: This seizure has been widely reported, and is of concern to front-line law enforcement and laboratory personnel due to the potentially serious health consequences resulting from fentanyl exposure. The salt form and presence of ANPP confirm that the fentanyl in the case was clandestinely manufactured, and its extraordinarily high purity indicates production by an experienced laboratory operator. It is suspected that this individual is the source for the fentanyl responsible for the ongoing epidemic of heroin/fentanyl-related overdoses and deaths in the northeastern and upper mideastern United States.

**- INTELLIGENCE ALERT -**

**ECSTASY TABLETS CONTAINING MDMA AND 3,4-METHYLENEDIOXY-DIMETHYLAMPHETAMINE (MDDMA) IN JOHNSON COUNTY, KANSAS**

The Johnson County Sheriff's Office Criminalistics Laboratory (Mission, Kansas) recently received a multi-exhibit submission consisting of: A) three bags of white powder (confirmed cocaine); B) two red, round tablets with an apple logo (confirmed MDMA); and C) two and one half white, round tablets with a stylized "X" (cross or crossbones) logo, suspected MDMA (see Photo 3). The exhibits were seized by the Mission Police Department pursuant to a DUI traffic stop in Mission. The "X" tablets were approximately 8 millimeters in diameter by 4 millimeters in thickness, and were rather crudely manufactured (average weight not obtained, but typical of Ecstasy tablets). Analysis by GC/MS confirmed primarily MDMA, but also a small amount of 3,4-methylenedioxydimethylamphetamine (MDDMA) and caffeine, in an approximate 100 : 3 : 1 ratio based on the TIC. MDDMA is a structural isomer of 3,4-methylenedioxyethylamphetamine (MDEA); therefore, the identification was confirmed via comparison with an authentic standard provided by the DEA. The MDMA was not formally quantitated, but the loading appeared to be typical of Ecstasy tablets. These were the first confirmed tablets containing MDDMA, and also the first tablets with the stylized "X" logo, submitted to the laboratory.



**Photo 3**

[Additional Information: As noted above, MDDMA and MDEA are closely related structural isomers; therefore, their GC retention times and mass spectra are expected to be similar. In fact, using an HP-5MS column and the laboratory's standard MDMA analysis parameters, the retention times only differed by approximately 0.1 minutes. Both mass spectra display a small molecular ion at  $m/z = 206$ , and are dominated by the parent ion at  $m/z = 72$ . The most significant differences between the two compounds are the 44 and the 135 ions. MDDMA has 44 and 135 ions at approximately 2% and 3% relative to the 72 ion, while MDEA has 44 and 135 ions at approximately 11% and 9% relative to the 72 ion. There is also an absence (or near absence) of a 95 ion in the MDEA spectrum. The full scale and expanded mass spectra of MDDMA and MDEA are displayed on the next two pages.]

\* \* \* \* \*

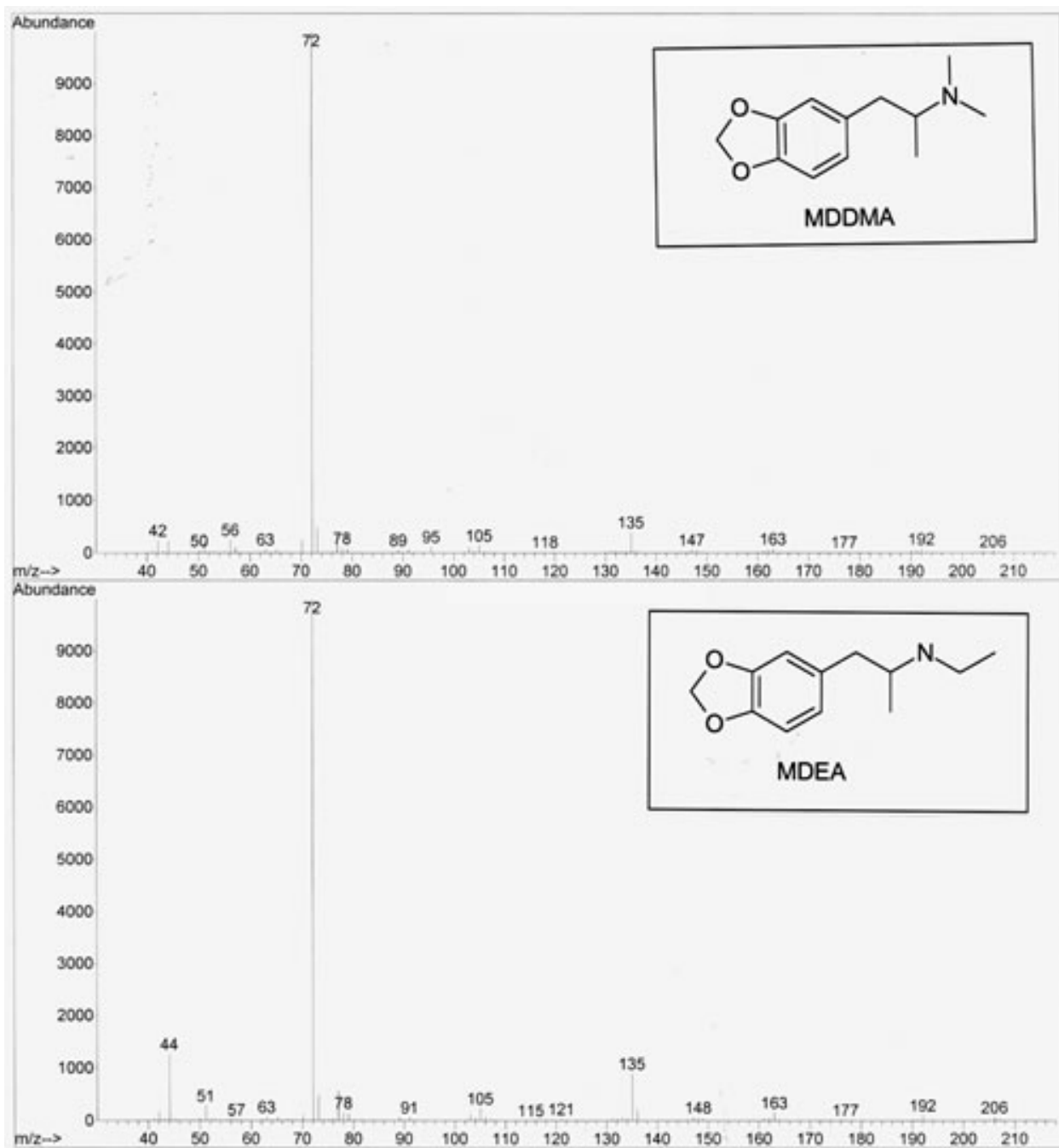
**- INTELLIGENCE ALERT -**

**HEROIN CAPSULES IN NEW HAMPSHIRE**

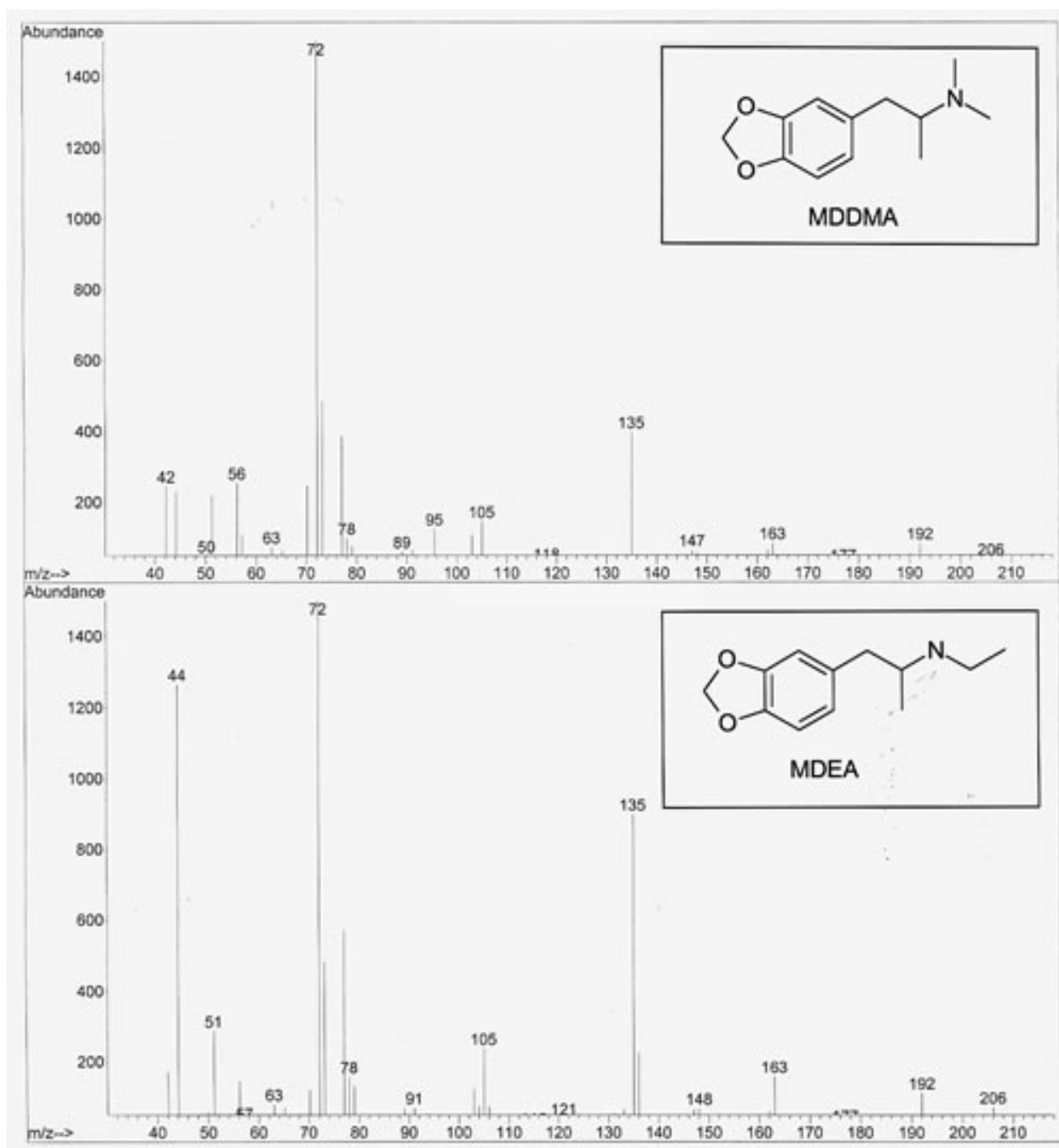
The New Hampshire State Police Forensic Laboratory (Concord) recently received a multi-exhibit submission consisting of: A) hand rolled cigarettes containing marijuana; B) pharmaceutical tablets containing hydrocodone and acetaminophen; C) pharmaceutical tablets containing oxycodone and acetaminophen; and D) 20 clear capsules containing a light brown powder, unknown/suspected controlled substance (photo not taken). The exhibits were seized by

the New Hampshire Drug Task Force in central New Hampshire (exact locale and circumstances of seizure not available). The capsules were 23 millimeters long and 9 millimeters in diameter. Analysis of the powder (total net mass 5.32 grams) by color testing (Marquis), UV, GC, and GC/MS identified heroin, promethazine, procaine, and caffeine (not formally quantitated, but in approximately a 100 : 50 : 10 : 10 ratio). This was the first such submission to the laboratory.

\* \* \* \* \*



#### FULL SCALE MASS SPECTRA OF MDDMA AND MDEA



### EXPANDED SCALE MASS SPECTRA OF MDDMA AND MDEA

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[Editor's Notes: For a recent article on MDDMA and MDEA, see: Vande Castele SR. LC-MS/MS in the elucidation of an isomer of the recreational drug methylenedioxyethylamphetamine: Methylenedioxydimethylamphetamine. *Journal of Separation Science* 2005;28:1729. For a recent case report of tablets containing MDDMA, see: Anonymous. Ecstasy Mimic Tablets (Containing Caffeine, Methamphetamine, Lidocaine, and an Unknown Phenethylamine) in Broward County, Florida. *Microgram Bulletin* 2006;39(2):18.]



**- INTELLIGENCE ALERT -**

**LSD BLOTTER ACID MIMICS (CONTAINING 2,5-DIMETHOXY-4-CHLORO-AMPHETAMINE (DOC)) IN BOCA RATON, FLORIDA**

The Palm Beach County Sheriff's Office (West Palm Beach, Florida) recently received 32 off-white, 1/4 inch square pieces of blotter paper (total net mass 0.36 grams), suspected LSD (photo not available). The exhibits were acquired in Boca Raton by the Boca Raton Police Department. Although typical of LSD blotter acid in appearance, the paper did not fluoresce under UV, and methanolic extracts spotted on filter paper did not give the characteristic purple color when treated with Ehrlich's reagent (PDAB). Further analysis of the methanolic extracts by GC and GC/MS indicated not LSD but rather 2,5-dimethoxy-4-chloroamphetamine, also known as DOC (not quantitated, but a fairly high loading based on the gas chromatogram). This is the first ever submission of DOC to the laboratory.

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**- INTELLIGENCE ALERT -**

**COCAINE IN WICKER BASKETS (FROM PERU) AT THE GEORGE BUSH INTERCONTINENTAL AIRPORT, HOUSTON, TEXAS**

The Houston Police Department Crime Laboratory (Texas) recently received 38 well-crafted decorative wicker baskets (three different sizes) suspected to contain cocaine (see Photo 4). The baskets were shipped as air freight on a flight arriving at the George Bush Intercontinental Airport from Peru, and were seized in a combined operation by Immigration and Customs Enforcement (ICE) personnel and the Houston Police Department. The vertical supports in the baskets actually consisted of plastic drinking straws wrapped with wicker-colored paper and capped at both ends with genuine wicker plugs, to give them an authentic appearance; each straw contained a fine white powder (see Photo 5, next page). There were approximately 200 straws in all, containing a total net weight of 12.3 kilograms of powder. Analysis by GC/MS, FTIR-ATR, and UV/Vis confirmed 76 percent cocaine hydrochloride. Unusually, the cocaine in (only) the smaller baskets was also adulterated with lidocaine (not quantitated). This was the first such submission to the laboratory.



**Photo 4**

[Editor's Notes: This seizure is somewhat similar to one reported in the February 2006 issue of *Microgram Bulletin*. In that case, the cocaine was contained in plastic sleeves that were wrapped

with brightly colored cloths, which were then used as the wickers for the basket. Those baskets arrived at the Miami International Airport on a flight from Haiti.]



**Photo 5**

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**- INTELLIGENCE ALERT -**

**COCAINE IN BAMBOO STICKS (FROM GUYANA) AT JFK AIRPORT, NEW YORK**

The DEA Northeast Laboratory (New York, New York) recently received 73 bamboo sticks, each about 1 foot long, each containing a white powder, suspected cocaine (see Photo 6). The exhibits were shipped from Guyana, and were seized by Immigration and Customs Enforcement personnel at the JFK Airport mail handling facility. Analysis of the powder (total net mass 876.9 grams) by GC/FID, GC/MS, and FT-IR/ATR confirmed 78 percent cocaine hydrochloride, adulterated with methylephedrine and diltiazem (adulterants not quantitated). The Northeast Laboratory routinely receives cocaine concealed in a wide variety of containers, but this was the first ever submission of a controlled substance in bamboo sticks. It is unknown what (if anything) the sticks were supposed to be.



**Photo 6**

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**- INTELLIGENCE ALERT -**

**HEROIN IN FALSE CAPACITORS IN COMPUTER POWER UNITS (FROM VENEZUELA) AT MIAMI INTERNATIONAL AIRPORT, FLORIDA**

The DEA Southeast Laboratory (Miami, Florida) recently received 35 computer power units, each containing 8 apparent capacitors attached to their internal circuit boards, each of which contained a light brown powder, suspected heroin (see Photos 7 and 8). The exhibits were seized by Immigration and Customs Enforcement personnel from an international shipping company flight arriving at Miami International Airport from Caracas, Venezuela. Unusually, the power units were intact and appeared to be functional, despite the installation of the false capacitors. The powder (total net mass 4.928 kilograms in 256 capacitors) was wrapped in plastic before insertion into the capacitors, and each capacitor was then sealed with wax. Analysis by GC/MS and FTIR confirmed 75 percent heroin hydrochloride. This is the first such submission to the Southeast Laboratory.

[Editor's Note: A very similar submission was reported in the June 2004 issue of *Microgram Bulletin*. In that case, nine large capacitors that were attached to a circuit board were also found to contain heroin (in this latter case, the circuit board was standalone - not enclosed in anything else). At least two more of these circuit boards were seized subsequent to the initial report. Similar to the current seizure, all three of the circuit board/capacitor units in those cases were seized off flights arriving from Venezuela (in those cases, to the airport in Philadelphia). In addition, a somewhat similar submission was reported in the March 2002 issue of *Microgram* (note that this issue is law enforcement restricted). In that seizure, "metallic tubes" (similar in appearance to large capacitors) containing heroin were found inside a CPU case. That seizure was made within New York City (not at an airport), and the original source of the CPU case was not reported.]



**Photo 7**



**Photo 8**

**- INTELLIGENCE ALERT -**

**ECSTASY MIMIC TABLETS (CONTAINING AMPHETAMINE SULFATE)  
IN GULFPORT, MISSISSIPPI**

The DEA South Central Laboratory (Dallas, Texas) recently received eight 1.5 quart plastic bags containing a total of 17,290 rather poorly manufactured, white, round tablets with a faint “Tasmanian Devil” logo, suspected MDMA (see Photos 9 and 10). The bags had been hidden in a large pipe inside an abandoned storage unit in Gulfport, Mississippi, and were seized by a local Task Force Officer. The tablets were approximately 11 millimeters in diameter and 2.5 millimeters in width, and had an average weight of 248 milligrams. Analysis by NMR, GC/MS, FTIR, and HPLC, however, indicated not MDMA but rather amphetamine sulfate (38 milligrams per tablet). The salt form and lack of clandestine manufacturing impurities indicate that the amphetamine in this case was very likely diverted from pharmaceutical stocks. Although the DEA laboratory system has previously received tablets containing amphetamine sulfate, this is an unusually large seizure of such tablets, especially for the South Central Laboratory.



**Photo 9**



**Photo 10**

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**- INTELLIGENCE BRIEF -**

**KHAT NEAR TOLEDO, OHIO**

The Ohio State Highway Patrol Crime Laboratory (Columbus, Ohio) recently received two black pieces of luggage and two red duffel bags, containing in total 490 leaf-wrapped bundles of plant material, presumed khat (photo not available). The exhibits were seized by the Findlay District Patrol Headquarters - Criminal Patrol Unit pursuant to a traffic stop on I-80 West near Toledo. The plant material (total net mass 42.74 kilograms) was frozen upon arrival at the laboratory to prevent conversion of cathinone to cathine while awaiting workup. After methanolic extraction, standard acid/base workup, and back-extraction with butyl chloride, analysis by GC/FID and GC/MS identified cathinone and cathine, confirming khat (not quantitated). This was the second large submission of khat to the laboratory this year.

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6. Skulska A, Kala M, Parczewski A. **Fentanyl and its analogues in the forensic laboratory. Medical and analytical problems.** Z Zagadnień Nauk Sadowych 2004;59:127. [Editor’s Notes: An overview. Focus is analysis in complex biological matrices. Contact: Faculty of Chemistry, Jagiellonian University, Krakow, Poland.]

7. Sproll C. **New methods of morphine analysis in food. No intoxication from poppy cake.** CLB Chemie in Labor und Biotechnik 2005;56(10):348. [Editor's Notes: Uses HPLC-MS/MS to analyze for morphine, codeine, and other alkaloids. This article is written in German. Contact: Chemisches und Veterinaruntersuchungsamt, Karlsruhe, Germany.]
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\* \* \* \* \*

## SCIENTIFIC MEETINGS

### 1. Title: 16th Annual CLIC Technical Training Seminar

(Second Posting)

**Sponsoring Organization:** Clandestine Laboratory Investigating Chemists Association

**Inclusive Dates:** September 6 - 9, 2006

**Location:** Hong Omni Mont-Royal Hotel (Montreal, Quebec, Canada)

**Contact Information:** See O.C. Anderson (620 / 792-4353 or carl.anderson -at- kbi.state.ks.us)

**Website:** None Provided

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## NEW EMAIL ADDRESSES NEEDED

The email addresses for the following organizations returned rejection notices to the *Microgram* Editor for at least the past three issues of *Microgram Bulletin*, and therefore the respective organizations have been dropped from the subscription list. Note that the errors include "mailbox full", "over quota", "user not found", or "user unknown" messages, and also a variety of anti-spam/filtering rejection messages (the latter resulting from failure to "whitelist" the [microgram\\_editor@mailsnare.net](mailto:microgram_editor@mailsnare.net) address). The *Microgram* Editor requests your assistance in contacting these organizations, determining if they wish to remain on the *Microgram* subscription e-net, and if so asking them to forward a valid email address to the [microgram\\_editor@mailsnare.net](mailto:microgram_editor@mailsnare.net) address. In addition, if the Office has closed or is known to be no longer interested, please forward that information to the *Microgram* Editor.

### U.S. Subscribers (by State, except U.S. Government organizations):

Alaska - Wasilla Police Department;

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Arkansas - Conway Police Department;

California - CHP/Investigative Services Unit (Los Angeles); San Diego Sheriff's Crime Laboratory;  
Thermo Electron Corporation (San Jose);

Connecticut - Ciencia, Inc. (Hartford);

Kansas - Kiowa County Sheriff;

Maine - Biddeford Police Department;

Michigan - Michigan State Police/Bridgeport Forensic Science Laboratory;

Minnesota - Lower Sioux Tribal Police Department (Morton);

Missouri - Independence Police Department;

New Jersey - Ocean County Prosecutor's Office;

New York - New York State Division of Criminal Justice Services (Albany); Rochester/Office of the Medical Examiner; Suffolk County Crime Laboratory;

North Carolina - Asheboro Police Department; Forsyth County - EAD Crime Laboratory (Winston-Salem);

Texas - Tarrant County Medical Examiners Office;

U.S. Government - DOE/Lawrence-Livermore National Laboratory; USAF - HQSAF/SF; U.S. Army Criminal Investigations Laboratory (Forest Park, Georgia);

Virginia - Virginia Beach Police Department;

Washington, DC - Office of the Chief Medical Examiner;

Wyoming - Wyoming Division of Criminal Investigation (Evanston).

**Non-U.S. Subscribers (by Country):**

Canada - Health Canada/Drug Analysis Service (Longueuil, Quebec); RCMP Forensic Laboratory (Winnipeg, Manitoba);

Denmark - Aarhus Universitet/Institute of Forensic Medicine;

France - Laboratoire de Police Scientifique de Lille;

Germany - BKA/Wiesbaden; Landeskriminalamt Bayer (Muenchen); Landeskriminalamt Berlin;

Hong Kong - Hong Kong Police Force - Narcotics Bureau (Wanchai);

Iceland - University of Iceland/Department of Pharmacology (Reykjavik);

Switzerland - Swiss Customs Administration - DEA/Bern;

United Kingdom - Laboratory of the Government Chemist/Middlesex; Southampton University Hospitals - Critical Care Unit/Hampshire;

West Indies - Trinidad and Tobago Forensic Science Center.

\* \* \* \* \*

Mobile phones have become one of the most preferred methods of communication in today's technology hungry world. Not surprisingly, mobile phones have also become quite popular among criminals, and have played an ever increasing role in their illicit activities. Thus, mobile phones can offer unique and potentially invaluable investigative information and leads for law enforcement personnel.

Mobile Phone Forensics is the science of retrieving digital data from a mobile phone using approved methods and under forensically sound conditions. This includes the examination of data found in the phone's internal memory, Subscriber Identity Module (SIM) card, and memory card(s). Recoverable data typically includes contact numbers, incoming calls, sent and missed calls, call times, Short Message Service (SMS) messages, text, images, and videos.

The major challenges for the computer forensic investigator is how to download and extract this information, and then to organize and communicate the findings to the case agent in a rapid and efficient manner. Unfortunately, with wireless communication technologies changing on seemingly a daily basis, it has become increasingly difficult for the law enforcement community to acquire and maintain the tools and expertise needed to properly conduct mobile phone forensics.

### Available Technologies

Today's mobile phone devices come in a huge variety of shapes and sizes. Much more importantly, however, they also have quite a wide variety of capabilities. Even the least sophisticated models can be password protected, and can store hundreds of individuals' contact information - while more advanced models can take and store both digital photos and even digital video.

One of the most popular and most sophisticated mobile phone devices is the Personal Digital Assistant (commonly known as a "PDA"). These have their own operating systems, and can actually be utilized as mini-computers. They not only make calls and store contact information, but also can connect to the internet, thereby giving their users the ability to send/receive email communications, images, photos, and videos. Advanced models have the capability to encrypt their communications, and can also store information on removable media like flash memory cards.

From a forensic viewpoint, there is one major advantage to improved mobile phone technology, that being *non-volatile memory*. Earlier generations of mobile phones were wholly dependent on their internal batteries to maintain stored information; therefore, a critical aspect to seizures was to recharge or replace the batteries as soon as possible, to ensure that the data wasn't lost prior to forensic examination. This is no longer required.

## Available Forensic Software

Unfortunately, available software for mobile phone forensics is quite limited compared to the available software for “standard” computer forensics. As implied above, this is in large part due to the rapid and ongoing changes in mobile phone technologies. These limitations can cause various problems for computer forensic examiners. For example, a specific software program may work well with certain types of mobile phones, but it may only retrieve limited information from other types of mobile phones - and furthermore, this is regardless of whether the software was specifically developed for forensic use, or was instead developed by the manufacturer to retrieve data (in the latter case, the software usually is designed to recover just the contact information). It may be that no software program will work well on a specific phone. For these reasons, it is (still) often necessary to manually retrieve the information (that is, to hand-search the phone using its keypad and menu) - potentially a very tedious and labor-intensive endeavor.

## Available Forensic Hardware

Another major problem in mobile phone forensics is interfacing the phone with the examination computer. Most of the current forensic and commercial software programs cannot retrieve information from mobile phones without appropriate hardware connections. Such hardware includes various adapters, including both wireless (that is, infrared) and brand-specific plug-in systems. Commercially available hardware may contain multiple adapters, for use with all major mobile phone brands. These adapters can both connect the mobile phone device to the examination computer and recharge the battery on most mobile phones.

## Conclusions

At present, there are significant limitations to the type and amount of information that can be retrieved using mobile phone forensics software. There is no comprehensive software program for mobile phone forensics - and due to the rapid technological advances in the field, this situation is likely to continue, at least in the near-term. The various software options that are currently available all have their pros and cons. Therefore, a laboratory has to maintain a vast forensic software library in order to comprehensively retrieve all the information from a mobile phone (that is, regardless of brand or model). This can cause severe budgetary distress. For this reason, it may be impossible for some small computer forensic operations to handle seized mobile phone devices (except by manual searching). In summary, as long as mobile phone technology continues to evolve and diversify, mobile phone forensics will remain a challenge to computer forensic examiners.

Questions or comments? E-mail: [Walter.Aponte -at- usdoj.gov](mailto:Walter.Aponte-usdoj.gov)

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# Microgram

## *Bulletin*

**Published by:**

The Drug Enforcement Administration  
Office of Forensic Sciences  
Washington, DC 20537

The U.S. Attorney General has determined that the publication of this periodical is necessary in the transaction of the public business required by the Department of Justice. Information, instructions, and disclaimers are published in the January issues.

- JULY 2006 -

**- INTELLIGENCE ALERT -**

**PLASTIC LUGGAGE (CONTAINING COCAINE) SEIZED IN THE COMALAPA INTERNATIONAL AIRPORT IN SAN SALVADOR**

The DEA Special Testing and Research Laboratory (Dulles, Virginia) recently received a collection of shards of hard, black plastic, suspected to contain cocaine (see Photo 1). The exhibits were pieces of the hard shell of a suitcase, and were seized by the El Salvador Civil National Police at the Comalapa International Airport in San Salvador. The material (total net mass 24.8 grams) would not dissolve in water. Analysis of methanol and chloroform extracts by GC/FID and GC/MS confirmed 7.3 percent cocaine (calculated as the hydrochloride). The Special Testing and Research Laboratory has previously received similar items composed of plastic matrices containing cocaine.



**Photo 1**



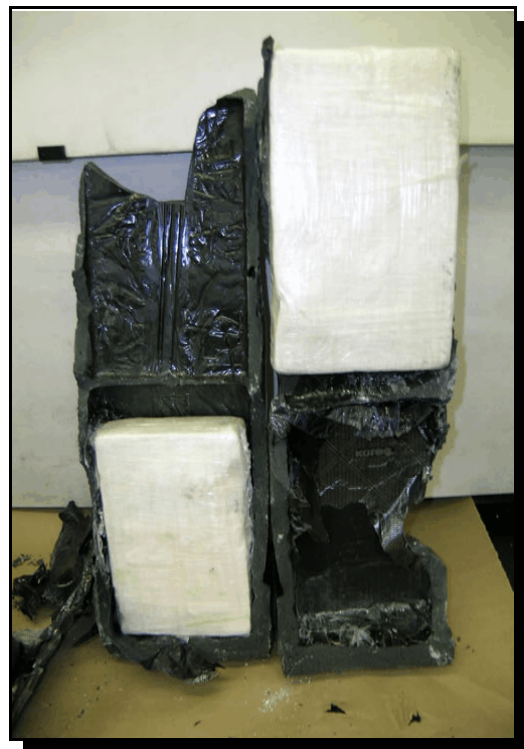
**- INTELLIGENCE ALERT -**

**AZTEC (?) STATUE CONTAINING COCAINE AT LOGAN  
INTERNATIONAL AIRPORT (BOSTON, MASSACHUSETTS)**

The DEA Northeast Laboratory (New York, New York) recently received a black, plastic statue, possibly of an Aztec idol, that contained four bricks of white powder, suspected cocaine (see Photos 2 and 3; note that the statue was about 17 inches high by 6 x 6 inches square at its base). The exhibit was seized by Immigration and Customs Enforcement personnel from a passenger arriving at Logan International Airport (Boston, Massachusetts). The passenger's starting point was not provided. Analysis of the powder (total net mass 3.895 kilograms) by GC/FID, GC/MS and FTIR/ATR confirmed 79 percent cocaine hydrochloride and diltiazem (not quantitated). The Northeast Laboratory routinely receives cocaine concealed in a wide variety of items, including statues, but this was the first submission of this particular type of statue.



**Photo 2**



**Photo 3**

\* \* \* \* \*

**- INTELLIGENCE ALERT -**

**UNUSUALLY SIZED AND PACKAGED COCAINE BRICKS IN ROLLA, MISSOURI**

The DEA North Central Laboratory (Chicago, Illinois) recently received 34 packages of two distinctly different sizes, all containing compressed, off-white powders, suspected cocaine (see Photo 4, next page). The exhibits were seized in Rolla, Missouri, pursuant to a traffic stop by the Phelps County Sheriff's Department. The 7 smaller packages appeared to be typical kilo-sized

bricks; analysis by color tests, FTIR, GC/MS, and GC/FID confirmed 86 percent cocaine hydrochloride (total net mass of 7 bricks 6.77 kilograms). The 27 larger packages each contained 7 “mini-bricks,” each of which was wrapped in black tape that was marked with a galloping white mustang logo (see Photo 5). The “mini-bricks” in these sub-packages also had an impression of a rearing mustang (photo contrast insufficient for display). Analysis by color tests, FTIR, GC/MS, and GC/FID confirmed 82 percent cocaine hydrochloride and diltiazem (not quantitated). The total net mass in the 189 “mini-bricks” was 27.31 kilograms (combined net mass of all 34 packages 34.08 kilograms). This was the first submission of this unusual type of packaging to the North Central Laboratory.



**Photo 4**



**Photo 5 - Note “Mustang” Logo on Black Wrapping**

**- INTELLIGENCE ALERT -**

**VERY LARGE SEIZURE OF ECSTASY COMBINATION TABLETS  
AT THE BLAINE, WASHINGTON POINT OF ENTRY**

The DEA Western Laboratory (San Francisco, California) recently received a very large submission of approximately 660,000 tablets of 9 different logo types, all suspected Ecstasy (see Photo 6). The exhibits were seized by Immigration and Customs Enforcement personnel from a tractor-trailer attempting to enter the United States from Canada at the Blaine, Washington Port of Entry. The logo/color combinations were separated by type, and included: ( T )/red-orange (140,000); Thumbs-Up/yellow (220,000); Smiley Face/white (50,000); Dolphin/blue (70,000); Ferrari Horse/yellow (55,000); Triple X/pink (55,000); Skull and Crossbones/green (40,000); Thumbs Up/red (25,000); and ( m )/pink (5,000). Analysis of the tablets (total gross weight 217 kilograms) by GC/FID, GC/MS, and FTIR/ATR confirmed MDMA (14 - 25 percent) and caffeine (not quantitated) in all tablets, and ketamine (2 - 4 percent), methamphetamine (2 - 4 percent), procaine (not quantitated), and/or dimethyl sulfone (not quantitated) in various combinations, varying by tablet type. Of note, dimethyl sulfone is being increasingly encountered in Ecstasy tablets submitted to the Western Laboratory (5 percent of all tablets in CY 2005, and 20 percent of all tablets in CY 2006 (to date)). This is the largest ever Ecstasy tablet submission to the Western Laboratory.



**Photo 6**



**- INTELLIGENCE ALERT -**

**“TURANABOL” (DEHYDROCHLORMETHYLTESTOSTERONE)  
IN WINCHESTER, VIRGINIA**

The DEA Mid-Atlantic Laboratory (Largo, Maryland) recently received a multi-component submission of steroids and steroid-related exhibits that included 15 bottles labeled as “Turanabol,” containing “Chlordehydromethyltestosterone,” as manufactured by “Golden Triangle Pharmaceuticals” of Hefei Anhui, China (see Photo 7). The exhibits were seized by agents from the DEA Winchester (Virginia) Post of Duty, pursuant to a consent search at a local residence. Unusually, despite identical appearances and lot numbers, the bottles contained either all orange or all yellow capsules, 100 per bottle. The capsules were 5/8's inch in length, and were otherwise nondescript. Six bottles contained orange tablets (total net mass of 600 capsules 109.4 grams); analysis by GC, GC/MS, and NMR indicated dehydrochlormethyltestosterone (4-chloro-17 $\beta$ -hydroxy-17 $\alpha$ -methylandrosta-1,4-dien-3-one; not quantitated). Nine bottles contained yellow tablets (total net mass of 900 capsules 157.3 grams); analysis (same techniques) indicated dehydrochlormethyltestosterone with minor amounts of stanozolol and methandrostenolone (not quantitated). This was the first known submission of dehydrochlormethyltestosterone to the DEA laboratory system. Despite the apparently commercial packaging, this unusual steroid is not produced by any major pharmaceutical company, and appears to be available only on the black market. It is listed in The 2006 Prohibited List/World Anti-Doping Code. Hefei Anhui is a provincial capital in the People's Republic of China.



**Photo 7**

\* \* \* \* \*

**- INTELLIGENCE ALERT -**

**LARGE POLYDRUG SEIZURE IN THESSALONIKA, GREECE**

The General State Chemical Laboratory's 2nd Chemical Division Seized Materials Laboratory (Thessaloniki, Greece) recently received a polydrug submission from the Police Department of Polygyros (Halkidiki, Greece), seized from a residence in Thessalonika, including:

1. Forty-two dark brown bricks (total net mass 2.762 kilograms), one of them bearing the Porsche logo (See Photo 8, next page), suspected cannabis resin (confirmed).
2. Seven samples of dried plant material wrapped in plastic (total net mass 244.6 grams), suspected as marijuana (confirmed).
3. Five pieces of black paste (total net mass 31.1 grams), suspected cannabis resin (identified as opium).
4. Six samples of white powder wrapped in plastic (total net mass 27.4 grams), suspected cocaine (confirmed).

5. One sample of white powder wrapped in plastic (total net mass 1.1 grams), suspected cocaine (identified as a mixture of amphetamine and cocaine in approximately a 29 : 1 ratio based on their TICs).
6. One sample of a brownish, dried, powdered material wrapped in plastic (total net mass 1.0 grams), suspected unknown drug substance (tentatively identified mescaline (possible peyote)).
7. Six Hipnosedon® tablets (commercial flunitrazepam 1 milligram tablets (confirmed)).
8. One green tablet (7 x 3 millimeters, 160 milligrams, with a "\$" logo), suspected MDMA (confirmed 8.4 percent MDMA (see Photo 9)).
9. Four grey tablets (7 x 4 millimeters, 194 milligrams each, with a "fish" logo), suspected MDMA (confirmed 52.5 percent MDMA (see Photo 10)).
10. One beige triangular tablet (397 milligrams, with a faint "X" logo), suspected MDMA (confirmed 20.9 percent MDMA (see Photo 11, next page)).
11. Seven light green, biconvex tablets (10 x 2 millimeters, 320 milligrams each, with a highly detailed Versace relief logo on both sides), suspected MDMA (confirmed 28.7 percent MDMA (see Photo 12, next page)).
12. One beige tablet (8.5 x 4 millimeters, 330 milligrams, with a "heart" logo), suspected MDMA (confirmed 26.2 percent MDMA (no photo)).
13. Two grey tablets (6.5 x 3 millimeters, 165 milligrams each, with a "horse" logo ), suspected MDMA (confirmed 60.5 percent MDMA (see Photo 13, next page)).
14. Fifty-three paper squares imprinted with various patterns, and 113 microdots (3 star-shaped and 110 cylinder-shaped (no photos)), all suspected LSD (all confirmed).
15. One piece of bread (net mass 0.5 grams), suspected to contain LSD (confirmed).



**Photo 8**



**Photo 9**



**Photo 10**



Photo 11



Photo 12

Analyses were conducted by color testing (Duquenois, Marquis, Ehrlich, or Scott, as appropriate), GC/FID, GC/MS, and (for LSD only) TLC. This is the first time the laboratory has received this many and diverse samples from one seizure, the first time it has received a cannabis resin brick with a logo of any kind, the first time it has received a peyote sample, and the first time it has received star-shaped LSD microdots.



Photo 13

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## SELECTED REFERENCES

[Selected references are a compilation of recent publications of presumed interest to forensic chemists. Unless otherwise stated, all listed citations are published in English. Listed mailing address information exactly duplicates that provided by the abstracting service. Patents and Proceedings are reported only by their *Chemical Abstracts* citation number.]

1. Apollonio LG, Pianca DJ, Whittall IR, Maher WA, Kyd JM. **A demonstration of the use of ultra-performance liquid chromatography - mass spectrometry (UPLC/MS) in the determination of amphetamine-type substances and ketamine and toxicological analysis.** Journal of Chromatography, B. Analytical Technologies in the Biomedical and Life Sciences 2006;836(1-2):111. [Editor's Notes: The title technique was successfully demonstrated on a reference mixture of amphetamine, methamphetamine, ephedrine, pseudoephedrine, phentermine, MDA, MDMA, MDEA, and ketamine in less than 3 minutes. The focus of the article is toxicological. Contact: National Centre for Forensic Studies. University of Canberra, Bruce ACT 2601, Australia.]
2. Biera S, Ilias Y, Bicchi C, Veuthey J-L, Christen P. **Focused microwave-assisted extraction combined with solid-phase microextraction and gas chromatography - mass spectrometry for the selective analysis of cocaine from coca leaves.** Journal of Chromatography A 2006;1112:127. [Editor's Notes: Presents the title study. The results agreed with previous investigations, and was much faster than conventional GC (6 versus 35 minutes per analysis). Contact: Laboratory of Pharmaceutical Analytical Chemistry, School of Pharmaceutical Sciences EPGL, University of Geneva, 20 Bd d'Yvoy, 1211 Geneva Geneva 4, Switzerland.]



3. Blok A, Cox M, Ward C. **4-Chlorodiphenylmethane, a precursor specific methylamphetamine manufacturing by-product.** Journal of the Clandestine Laboratory Investigating Chemists Association 2006;16(2):14. [Editor's Notes: The title product results from use of pseudoephedrine pharmaceuticals containing cetirizine for the production of methamphetamine via the iodine/hypophosphorous acid route. Note that *JCLICA* is a law enforcement restricted journal. Contact: Flinders Univ. of South Australia, Bedford Park, South Australia, Australia.]
4. Cohen WS. **Ephedra used as a precursor in methamphetamine manufacturing.** Journal of the Clandestine Laboratory Investigating Chemists Association 2006;16(2):21. [Editor's Notes: Abstract details withheld in accordance with *Microgram* policy. Note that *JCLICA* is a law enforcement restricted journal. Contact: Contra Costa County-Coroner's Office, 1960 Muir Road, Martinez, CA 94593.]
5. Cone EJ. **Ephemeral profiles of prescription drug and formulation tampering: Evolving pseudoscience on the Internet.** Drug and Alcohol Dependence 2006;83S:S31. [Editor's Notes: An overview and discussion of prescription drug abuse, focusing on different aspects of misuse, and the role of Internet testimonials and instructions. Contact: ConeChem Research, LLC, 441 Fairtree Drive, Severna Park, MD 21146.]
6. DeFrancesco JV, Witkowski MR, Ciolino LA. **GHB Free Acid: I. Solution formation studies and spectroscopic characterization by 1HNMR and FT-IR.** Journal of Forensic Sciences 2006;51(2):321. [Editor's Notes: Presents the title study. The technique is especially suited for analysis of forensic samples containing the free acid, its corresponding salt, and GBL. Contact: U.S. Drug Enforcement Administration, North Central Laboratory, Chicago, IL 60606.]
7. Fourcroy J. **Designer steroids: Past, present, and future.** Current Opinion in Endocrinology & Diabetes 2006;13(3):306. [Editor's Notes: A historical overview and minor review of the title subject. Contact: Department of Surgery/Urology, Uniformed Services University Health Sciences, Bethesda, MD (zip code not provided).]
8. Grove AA, Rohwer ER, Laurens JB, Vorster BC. **The analysis of illicit methaqualone containing preparations by gas chromatography - mass spectrometry for forensic purposes.** Journal of Forensic Sciences 2006;51(2):376. [Editor's Notes: Presents the title study. The technique is suitable for quantitative analysis. Contact: Forensic Chemistry Laboratory, Department of Health, Private Bag X282, Pretoria 0001, South Africa.]
9. Guan F, Soma LR, Luo Y, Uboh CE, Peterman S. **Collision-induced dissociation pathways of anabolic steroids by electrospray ionization tandem mass spectrometry.** Journal of the American Society for Mass Spectrometry 2006;17(4):477. [Editor's Notes: Fragmentation pathways were elucidated for boldenone, methandrostenolone, tetrahydrogestrinone, trenbolone, normethandrolone, and mibolerone. Contact: Department of Clinical Studies, School of Veterinary Medicine, University of Pennsylvania, Kennett Square, PA (zip code not provided).]
10. Maroge W, Bordelon JA, Katz JM, Zhivago VR. **Large fentanyl and MDA laboratory in Los Angeles, California.** Journal of the Clandestine Laboratory Investigating Chemists Association 2006;16(2):12. [Editor's Notes: A brief overview of the subject laboratory. Note that *JCLICA* is a law enforcement restricted journal. Contact: DEA Southwest Laboratory, 2815 Scott St., Vista, CA 92081.]
11. Miller B, McKibben T. **Povidone-iodine.** Journal of the Clandestine Laboratory Investigating Chemists Association 2006;16(2):18. [Editor's Notes: An overview of methods for

identification of the title formulation. Note that *JCLICA* is a law enforcement restricted journal. Contact: Colorado Bureau of Investigation, Forensic Laboratory, Pueblo, CO (zip code not provided).]

12. Nguyen XT, Dang VD, Hoang TT. **Impurity profiling analysis of illicit methamphetamine by capillary gas chromatography. Part I - Study on and optimum analysis methods.** Tap Chi Hoa Hoc 2005;43(6):707. [Editor's Notes: Presents the title study. This article is written in Vietnamese. Contact: Criminal Sci. Dept., Bureau of Public Security, Vietnam.]
13. Poortman-Van der Meer A, Lock E. **Identification of 4-tert-butylamphetamine in clandestine amphetamine samples.** Journal of the Clandestine Laboratory Investigating Chemists Association 2006;16(2):23. [Editor's Notes: The title compound results from the presence of 4-tert-butylphenylacetone as an impurity in phenylacetone possibly produced in eastern Europe. Note that *JCLICA* is a law enforcement restricted journal. Contact: Netherlands Forensic Institute, Postbus 24044, 2490AA The Hague, The Netherlands.]
14. Toske SG, Cooper SD, Morello DR, Hays PA, Casale JF, Casale E. **Neutral heroin impurities from tetrahydrobenzylisoquinoline alkaloids.** Journal of Forensic Sciences 2006;51(2):308. [Editor's Notes: Four of the title compounds (laudanoline, reticuline, codamine, and laudanine), all naturally occurring in opium, form 18 detectable neutral impurities under typical heroin processing conditions. These latter impurities were found to be useful for sourcing illicit heroin. Contact: U.S. Drug Enforcement Administration, Special Testing and Research Laboratory, 22624 Dulles Summit Court, Dulles, VA 20166.]
15. Witkowski MR, Ciolino LA, DeFrancesco JV. **GHB Free Acid: II. Isolation and spectroscopic characterization for forensic analysis.** Journal of Forensic Sciences 2006;51(2):330. [Editor's Notes: Presents the title study. Includes preparation. Contact: U.S. Food and Drug Administration Forensic Chemistry, Cincinnati, OH 45237.]

#### Additional References of Possible Interest:

1. Barthelson RA, Sundareshan P, Galbraith DW, Woosley RI. **Development of a comprehensive detection method for medicinal and toxic plant species.** American Journal of Botany 2006;93(4):566. [Editor's Notes: Uses multiplexed ligation-dependent probe amplification (MLPA) on isolated genomic DNA to determine the presence of medicinal and/or toxic plant species (not specified in the abstract). Contact: Department of Plant Sciences, University of Arizona, Tucson, AZ 85721.]
2. Fudala PJ, Johnson RE. **Development of opioid formulations with limited diversion and abuse potential.** Drug and Alcohol Dependence 2006;83S:S40. [Editor's Notes: An overview. Contact: Behavioral Health Service, VA Medical Center and the Department of Psychiatry, University of Pennsylvania, School of Medicine, Philadelphia, PA 19104.]
3. Kojima M, Seki H, Yoshida S, Muranaka T. **DNA polymorphism in the tetrahydrocannabinolic acid (THCA) synthase gene in "drug-type" and "fiber-type" Cannabis sativa L.** Forensic Science International 2006;159(2-3):132. [Editor's Notes: Presents the title study. Of note, a specific PCR marker for the "drug-type" strains was identified, that was not present in the "fiber-type" strains. Contact: JYUGEI Institute, University Forests, Graduate School of Agriculture and Life Sciences, The University of Tokyo, 457 Kano, Minamizu, Shizuoka 451-0304, Japan.]

## SCIENTIFIC MEETINGS

### 1. Title: 16th Annual CLIC Technical Training Seminar

(Third Posting)

**Sponsoring Organization:** Clandestine Laboratory Investigating Chemists Association

**Inclusive Dates:** September 6 - 9, 2006

**Location:** Hong Omni Mont-Royal Hotel (Montreal, Quebec, Canada)

**Contact Information:** See O.C. Anderson (620 / 792-4353 or carl.anderson -at- kbi.state.ks.us)

**Website:** None Provided

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### 2. Title: 32nd Annual NEAFS Meeting

(Second Bimonthly Posting)

**Sponsoring Organization:** Northeastern Association of Forensic Sciences

**Inclusive Dates:** November 1 - 4, 2006

**Location:** Tarrytown DoubleTree Hotel (Westchester County, New York)

**Contact Information:** E. Schwartz (914 / 231-1810 or ess6 -at- westchestergov.com)

**Website:** None Provided

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## THE JOURNAL/TEXTBOOK COLLECTION EXCHANGE

The Journal/Textbook Collection Exchange is a service intended to facilitate the transfer of unwanted journals and textbooks to forensic libraries or other subscribers. At present, this service is offered once a quarter (in January, April, July, and October). The most current items are listed below. The offers are First Come/First Serve (except libraries have preference). There are no charges to the requestor. Provide full mailing address in request. **Important!:** Do not provide an address that irradiates mail!

- \* Engineering Drawing and Geometry, Hoelscher & Springer, 1963, 2nd
- \* Steam, Its Generation and Use, Babcock & Wilcox Co., 1963, 37th
- \* Engineering Mechanics - Dynamics (Volume II), Shames, 1966 2nd
- \* University Physics (Part 1), Sears - Zemansky, 1963, 3rd
- \* Elements of Physics (Volume 2), Shortley - Williams, 1965, 4th
- \* Aerodynamics for Engineering Students, Houghton - Brock, 1960
- \* Elementary Differential Equations and Boundary Value Problems, Boyce - DiPrima, 1965
- \* Business Law and Principles and Cases - Universal Code Edition, Lusk, 1966, U.C.C.
- \* The Dynamics and Thermodynamics of Compressible Fluid Flow (Parts I & II from Volume I), Shapiro, 1958
- \* Mechanical Vibrations, Tse - Morse - Hinkle, 1966
- \* Heat Transfer, Holman, 1963
- \* Automatic Controls, Harrison - Bollinger, 1966
- \* Calculus and Analytic Geometry - Part II, Thomas, 1964, 3rd
- \* Aircraft Structures, Peery, 1950
- \* Fluid Mechanics, Pao, 1967

- \* Elements of Physical Metallurgy, Guy, 1967, 2nd
- \* Engineering Mechanics - Statics, Shames, 1958
- \* Calculus and Analytic Geometry - Part I, Thomas, 1961, 3rd
- \* Mechanics and Dynamics of Machinery, Mabie, 1957, 2nd
- \* Combustion Engine Process, Lichty, 1967
- \* Engineering Mechanics of Deformable Bodies, Byars - Snyder, 1964, 2nd
- \* Engineering Mechanics - Dynamics, Shames, 1965
- \* Mechanical Engineering Design, Shigley, 1963
- \* Principles of Electrical Engineering, Del Toro, 1965

**All subscribers are encouraged to donate surplus or unwanted items/collections.** Reference texts and long runs of forensic/analytical journals are of particular interest; however, even single issues are worthwhile. If interested, please consult the *Microgram* website or contact the *Microgram* Editor for further instructions.

The next offering of journals and textbooks will be in the October 2006 issue of *Microgram Bulletin*.

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## THE DEA FY - 2006 and FY - 2007 STATE AND LOCAL FORENSIC CHEMISTS SEMINAR SCHEDULE

The remaining FY - 2006 schedule for the DEA's State and Local Forensic Chemists Seminar is as follows:

September 11 - 15, 2006

The upcoming FY - 2007 schedule is as follows:

November 13 - 17, 2006  
February 5 - 9, 2007  
May 7 - 11, 2007  
July 9 - 13, 2007  
September 10 - 14, 2007

Note that the school is open only to forensic chemists working for law enforcement agencies, and is intended for chemists who have completed their agency's internal training program and have also been working on the bench for at least one year. There is no tuition charge for this course. The course is held at the AmeriSuites Hotel in Sterling, Virginia (near the Washington/Dulles International Airport). A copy of the application form is reproduced on the last page of the August 2004 issue of *Microgram Bulletin*. Completed applications should be mailed to the Special Testing and Research Laboratory (Attention: J. Kerlavage) at: 22624 Dulles Summit Court, Dulles, VA 20166. For additional information, call 703/668-3337.

In order for a Digital Evidence Laboratory to be American Society of Crime Laboratory Directors/ Laboratory Accreditation Board-*International* (ASCLD/LAB-*International*) accredited, it must have a Quality Assurance Program (QAP) that is administered by a Quality Assurance Manager (QAM). The QAM's role is to ensure that the laboratory is producing quality work in accordance with ISO 17025 standards, the laboratory's own Standard Operating Procedures (SOP's), and the supplemental rules and regulations of ASCLD/LAB-*International*. DEA's Digital Evidence Laboratory (SFL9) has specifically designated an examiner to be the Quality Assurance Program Manager (QAPM), who assists the Laboratory Director with all quality assurance issues.

The SFL9 QAP includes a series of tests that are administered annually to all qualified examiners. The QAM and QAPM monitor the knowledge and analytical techniques of the examiners by administering peer reviews and both internal and external proficiency tests. The objective of the QAP is to assess each examiner's abilities and (where necessary) provide feedback in order to ensure high quality work.

### Peer Reviews

A peer review is a unique quality control check that gives an examiner the opportunity to assess the quality of work produced by a fellow examiner, and potentially to learn new techniques or analytical processes. A peer review is a re-analysis of an already completed case, intended to confirm that all standard operating procedures and analytical protocols were properly followed. Check criteria include, e.g., that proper instrument calibration (Blank and Control) was done prior to the start of an examination, that a validated forensic image or copy of the media was used, and that the findings are supported by the methods that were used, and so on.

Discrepancies (if any) are brought to the attention of the QAPM, where they are reviewed and discussed with the reviewer. Any errors found during the review are then discussed with the examiner and corrected; if necessary, remedial training may be administered.

### Proficiency Testing

There are two basic types of proficiency tests: Internal and external. Both are required by ASCLD/LAB-*International*. An internal proficiency test is created and administered within the laboratory, while an external proficiency test is created and administered by an outside source, either an approved ASCLD/LAB test provider or (in the absence of an approved test provider) another Digital Evidence laboratory. Both types of tests are intended to document an examiner's abilities in performing basic examination procedures, to show that the methods are forensically valid, and that the findings are accurate.

The QAPM has to administer an internal proficiency test to each examiner, annually. The test usually consists of a sample exhibit, on which the examiner must show that they have mastered basic computer forensic techniques, including recovery of e-mail, Internet history, registry

information, file date and time stamp information, deleted files, etc. The exhibit is treated as evidence, and may be assigned with or without the examiner's knowledge that it is a test.

The laboratory also has to take an external proficiency test (or tests). The external test usually consists of a sample exhibit that is assigned by the laboratory director. The scope of the examination, requirements, and the grading are determined by the test provider. Again, the exhibit is treated as evidence, and may be assigned with or without the examiner's knowledge that it is a test.

### Summary

Quality Assurance is a collective effort, involving all laboratory personnel that are involved either in evidence analysis or in the review of analytical results and findings. It is the overall duty of the QAM to ensure that the laboratory is performing to high standards. The next article in this series will go into more detail concerning the other duties that the QAM must attend to, including re-analysis, validation, references, and more.

Questions or comments? E-mail: [Steven.L.Carter -at- usdoj.gov](mailto:Steven.L.Carter-usdoj.gov)

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# Microgram

## *Bulletin*

**Published by:**

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Office of Forensic Sciences  
Washington, DC 20537

The U.S. Attorney General has determined that the publication of this periodical is necessary in the transaction of the public business required by the Department of Justice. Information, instructions, and disclaimers are published in the January issues.

- AUGUST 2006 -

**- INTELLIGENCE ALERT -**

**“POT SHOTS” (SUSPENSIONS OF MARIJUANA IN HARD LIQUOR ) IN CHEROKEE COUNTY, OKLAHOMA**

The Oklahoma State Bureau of Investigation Northeast Regional Laboratory (Tahlequah) recently received a 135 exhibit submission that included 37 liquor bottles with green plant material suspended in the solutions, suspected marijuana (see Photo 1). The exhibits were seized by the Cherokee Nation Drug Task Force pursuant to a search of a residence in Cherokee County (details sensitive). There were many different varieties of liquor in the seizure. Intelligence indicated that the suspects would take the bottles to various events in the area and sell shots of the liquor; these were referred to as “Pot Shots.”\* Analysis of the plant material by microscopy confirmed marijuana, while analysis of the solutions (total net volume 29.75 liters) by GC and GC/MS confirmed  $\Delta^9$ -tetrahydrocannabinol (THC; quantitations not performed). Not surprisingly, liquors with higher alcohol concentrations also had higher THC concentrations. This was the first submission of this type to the laboratory.

[\* Editor’s Note: These solutions are also known as “Green Dragon.”]



**Photo 1**

**- INTELLIGENCE ALERT -**

**HIGH-POTENCY FENTANYL IN HOUSTON, TEXAS**

The Houston Police Department Crime Laboratory (Texas) recently received a polydrug seizure that included exhibits of a white powder and a chunky white substance, both suspected cocaine, and a brown granular powder, suspected heroin (see Photo 2). The exhibits were seized by the Houston Police from a local residence (details not provided). Analysis of the white powder (total net mass 6.7 grams) by color testing and FTIR/ATR, and of the chunky white substance (total net mass 4.3 grams) by color testing and GC/MS, confirmed cocaine in both cases

(quantitations not reported). The brown powder (total net mass 0.5 grams) was noted to have a distinct odor which was not consistent with the usual vinegar (acetic acid) odor of heroin. Analysis by color testing (Marquis), UV/Vis, and GC/MS indicated not heroin but rather 54 percent fentanyl; benzylfentanyl was also identified. This was the first submission of illicitly prepared fentanyl to the laboratory in recent memory.



**Photo 2**

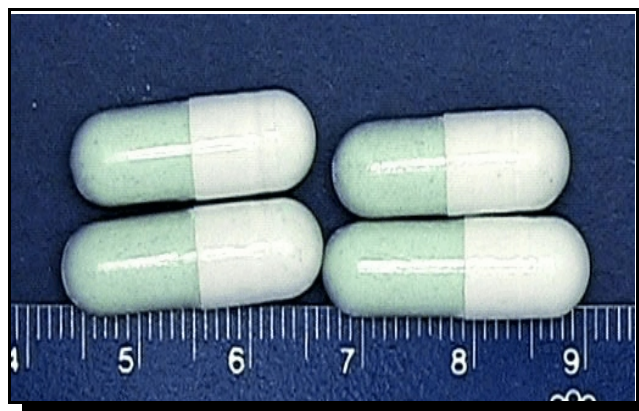
[Editor's Note: 54 percent fentanyl is extremely high for a "street level" sample.]

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**- INTELLIGENCE ALERT -**

**HYDROCODONE CAPSULES IN EASTERN KENTUCKY**

The Kentucky State Police Eastern Laboratory Branch (Ashland) recently received three separate submissions of capsules, containing either pink or green powders, suspected hydrocodone (see Photo 3). The capsules were all unmarked with clear bodies and white caps, and averaged 21 millimeters in length by 7 millimeters in diameter. The first two were acquired in eastern Kentucky by the Operation UNITE (Unlawful Narcotics Investigations, Treatment and Education) Task Force (details sensitive); the first consisted of one capsule containing a pink powder, while the second consisted of four capsules containing a green powder. The third was acquired in eastern Kentucky by the Kentucky State Police - East Drug Enforcement Special Investigation Branch (East DESI, details sensitive), and consisted of 49 capsules containing a green powder. Analysis



**Photo 3**

of the various powders by GC/MS confirmed the presence of hydrocodone and acetaminophen in all cases; quantitative analysis by GC/FID (third sample only) indicated 8.3 milligrams hydrocodone per capsule. The amounts and relative percentages of hydrocodone and acetaminophen suggested that the powders were *not* diverted pharmaceuticals. These were the first such submissions to the laboratory.

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**- INTELLIGENCE ALERT -**

***PARA*-METHOXYAMPHETAMINE (PMA) AND *PARA*-METHOXY-METHAMPHETAMINE (PMMA) IN GENOA, ITALY**

The Sezione Indagini Sulle Droghe d'Abuso of Polizia Scientifica of Rome recently received a small amount of white powder from Gabinetto Regionale di Polizia Scientifica of Genoa, suspected cocaine (no photo). The exhibit (total net mass 350 milligrams) was seized by the authorities from a user in Genoa. Preliminary screening by color testing suggested that the sample was not cocaine. Further analysis by GC/FID and GC/MS confirmed no cocaine and instead indicated a mixture of 27 percent *para*-methoxyamphetamine (PMA) and 14 percent *para*-methoxymethamphetamine (PMMA), both calculated as their bases. PMA has been scheduled in Italy since 1988, while PMMA has been scheduled since 2002; however, criminal penalties are not applicable for either substance for amounts under 450 milligrams. This was the first submission of a PMA/PMMA mixture to the laboratory.

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**- INTELLIGENCE ALERT -**

**QUALUDE MIMIC TABLETS (CONTAINING DIAZEPAM)  
IN LEXINGTON PARK, MARYLAND**

The Maryland State Police-Forensic Sciences Division (Pikesville) recently received 12 round, white tablets with a "LEMMON - 714" logo on one face and half-scored on the opposite face, apparent Qualudes (see Photo 4). The tablets were seized in Lexington Park by the St. Mary's County Bureau of Criminal Investigation Narcotics Unit, pursuant to the investigation of a home invasion. Psilocybe mushrooms, hashish, and a large number of marijuana

plants were also seized. Analysis of the tablets (net mass not determined) by UV/Vis, GC, GC/MS, and FTIR, however, indicated not methaqualone but rather diazepam, probably diluted with maltose (diazepam not quantitated). The last known submission of these diazepam-containing Qualude mimic tablets to the Forensic Sciences Division was over five years ago.



**Photo 4**



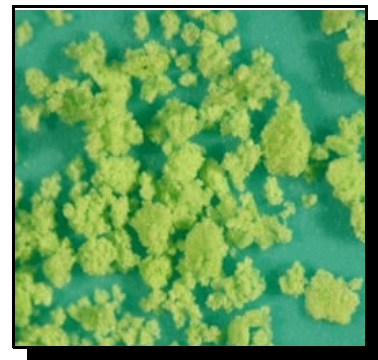
**- INTELLIGENCE ALERT -**

**CAPSULES CONTAINING APPARENT POWDERED MARIJUANA  
IN LINCOLN COUNTY, NEBRASKA**

The Nebraska State Patrol Satellite Crime Laboratory (North Platte) recently received 56 clear blister-packed capsules containing a light green, powdery substance, submitted as an unknown/possible narcotic (see Photo 5). The exhibits were seized by the Nebraska State Patrol pursuant to a traffic violation in Lincoln County. The capsules were sealed in a blister package that was marked only as being manufactured by MTS Medication Technologies. Analysis of the capsules by color testing, GC/MS, and FTIR indicated tetrahydrocannabinol, cannabidiol, and cannabinol, cut with sucrose (quantitation not performed). Interestingly, microscopic examination revealed no morphological characteristics of marijuana - probably because the material was so finely ground (see Photo 6). This is the first submission of these type capsules to the laboratory.



**Photo 5**



**Photo 6**

[Editor's Notes: MTS Medication Technologies is a legitimate company. According to their website, they "manufacture automated packaging machines and related consumables for prescription medications and nutritional supplements" - including blister packaging. These exhibits are the latest in a growing trend of blister-packaging of controlled substances in an (apparent) effort to make them appear to be legitimate consumer products.]

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**- INTELLIGENCE ALERT -**

**ECSTASY MIMIC TABLETS (CONTAINING AMPHETAMINE)  
IN PHOENIX, ARIZONA**

The Phoenix Police Department Laboratory Services Bureau (Arizona) recently received four separate submissions, each consisting of a box containing a bundle, suspected in all four cases to contain marijuana. The boxes were being individually mailed via an express mail service from Phoenix to Georgia, and were seized by the Phoenix Police. Each bundle was wrapped in numerous layers of cellophane, with layers of grease throughout the wrappings; the grease did not have a noticeable odor. Three of the bundles turned out to contain marijuana (total net mass approximately 4.1 kilograms); however, the fourth package, which was



**Photo 7**

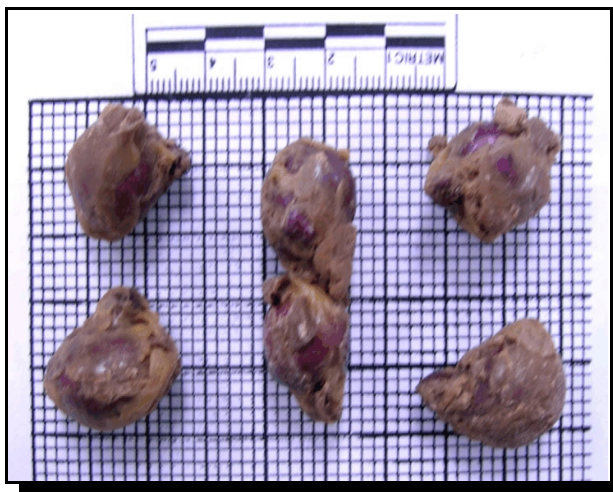
smaller than the other three but otherwise identical in appearance, contained 400 mottled tablets with a “check-off” logo on one face and half-scored on the opposite face, apparent Ecstasy (see Photo 7, previous page). Analysis of the tablets (total net mass approximately 90 grams) by color testing (Marquis) and GC/MS, however, indicated not MDMA but rather amphetamine (salt form not determined). The tablets were not formally quantitated; however, the GC/MS results suggested that the loading was quite high. Although the laboratory has previously received tablets with a similar logo, this is believed to be the first submission of amphetamine-containing Ecstasy mimic tablets.

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**- INTELLIGENCE ALERT -**

**BLACK TAR HEROIN “MILK DUDS” IN PHILADELPHIA, PENNSYLVANIA**

The DEA Northeast Laboratory (New York, New York) recently received six apparent chocolates, each of which actually consisted of a black tar-like material, suspected heroin, that was wrapped in multiple layers of different colored rubbers (probably balloons) and then covered with chocolate (see Photo 8). Because of their appearance, shape, and chocolate covering, these type of exhibits are sometimes referred to as “milk duds”. The exhibits were seized by agents from the FBI Philadelphia Division (location and details not provided). Unusually, the tar-like material could be ground into a brown powder but would return to its original black tar-like form over time. Analysis of the tar-like material (total net mass 9.6 grams) by GC/MS and GC/FID confirmed 17 percent heroin (salt form not determined, but calculated as the hydrochloride). The Northeast Laboratory rarely receives exhibits of black tar heroin, and these were the first submission of “milk duds.”



**Photo 8**

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**- INTELLIGENCE ALERT -**

**OXYCONTIN MIMIC TABLETS (CONTAINING FENTANYL)  
IN ALBUQUERQUE, NEW MEXICO**

The DEA South Central Laboratory (Dallas, Texas) recently received 44 green tablets with “OC” and “80” logos on opposite faces, apparent Oxycontin (see Photos 9 and 10, next page). The tablets were seized from an abandoned duffel bag in Albuquerque, New Mexico by agents from the DEA Albuquerque Resident Office (details not available). The tablets (total net mass 6.16 grams) were 6 millimeters in diameter by 3 millimeters width, distinctly smaller than legitimate

“OC/80” tablets; in addition, they were green all the way through (legitimate “OC/80” tablets are white inside). Analysis by GC/MS, GC/FID, and HPLC indicated not oxycodone but rather fentanyl (1.9 milligrams/tablet). This was the first submission of these type tablets to the South Central Laboratory.



**Photo 9**



**Photo 10**

[Editor's Note: Seizures of these types of tablets were previously reported in the January and April 2006 issues of *Microgram Bulletin*.]

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**- INTELLIGENCE ALERT -**

**HEROIN-LACED BATTING IN FURNITURE (FROM VENEZUELA)  
IN MIAMI, FLORIDA**

The DEA Southeast Laboratory (Miami, Florida) recently received 23 bags of grey colored batting that had been removed from two pieces of upholstered furniture, suspected to be laced with heroin (see Photo 11). The furniture (a chair and sofa) had been shipped from Venezuela, and was seized at the Miami Airport by Immigration and Customs Enforcement personnel. Analysis of extracts from the batting (total net mass 62.16 kilograms) by GC/MS and FTIR confirmed 14 percent heroin hydrochloride, equivalent to approximately 8.7 kilograms total net mass. This was the first submission of this type to the Southeast Laboratory.



**Photo 11**

\* \* \* \* \*

**- INTELLIGENCE BRIEF -**

**UNUSUALLY CO-PACKAGED “ICE” METHAMPHETAMINE AND COCAINE  
AT THE SAN YSIDRO (CALIFORNIA) POINT OF ENTRY**

The DEA Southwest Laboratory (Vista, California) recently received three packages, each wrapped with cellophane, carbon paper, and cellophane/grease, and each containing two sub-packages. In two of the packages, the first subpackage was a wooden box wrapped in black tape and foil containing an off-white crystalline material (see Photo 12, next page), while the second was a kilogram brick wrapped in black tape, cellophane, and grease and containing a compressed white powder with an impression of a dumbbell-like object (see Photo 13, next page), all suspected methamphetamine. The third package contained two of the wooden box subpackages.



The exhibits were seized by Immigrations and Customs Enforcement agents from a vehicle at the San Ysidro Point of Entry. Analysis of the off-white crystalline material in the wooden boxes (total net mass 1.766 kilograms) by GC, FTIR/ATR, and CE confirmed 98 percent d-methamphetamine hydrochloride. Analysis of the white powder in the kilogram bricks (total net mass 1.935 kilograms) by GC, FTIR/ATR, and GC/MS, however, indicated not methamphetamine but rather 48 percent cocaine hydrochloride, adulterated with benzocaine (not quantitated, but at approximately the same concentration as the cocaine, based on the gas chromatogram). The Southwest Laboratory routinely receives mixed loads of methamphetamine and cocaine, but this was the first submission where both were co-packaged.



Photo 12



Photo 13

\* \* \* \* \*

**Correction:** In the Solicitation for Information on Fentanyl in the May, 2006 issue of *Microgram Bulletin*, the CAS Number for 4-Anilino-*N*-phenethylpiperidone (also known as ANPP or Despropionylfentanyl) was incorrectly reported as: 39742-60-4; this is actually the CAS Number for 1-(*beta*-Phenethyl)-4-piperidone. The correct CAS Number for 4-Anilino-*N*-phenethylpiperidone is: 021409-26-7.

\* \* \* \* \*

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## SELECTED REFERENCES

[Selected references are a compilation of recent publications of presumed interest to forensic chemists. Unless otherwise stated, all listed citations are published in English. Listed mailing address information exactly duplicates that provided by the abstracting service. Patents and Proceedings are reported only by their *Chemical Abstracts* citation number.]

1. Anastos N, Lewis SW, Barnett NW, Sims DN. **The determination of psilocin and psilocybin in hallucinogenic mushrooms by HPLC utilizing a dual reagent acidic potassium permanganate and tris(2,2'-bipyridyl)ruthenium(II) chemiluminescence detection system.** *Journal of Forensic Sciences* 2006;51(1):45. [Editor's Notes: Presents the title study. (This article appears to be closely related to: Anastos N, Barnett NW, Lewis SW, Gathergood N, Scammells PJ, Sims DN. Determination of psilocin and psilocybin using flow injection analysis with acidic potassium permanganate and tris(2,2'-bipyridyl)ruthenium(II) chemiluminescence detection, respectively. *Talanta* 2005;67(2):354.) Contact: School of Biological and Chemical Sciences, Deakin University, Geelong, Victoria 3217, Australia.]
2. Armellin S, Brenna E, Frigoli S, Fronza G, Fuganti C, Mussida D. **Determination of the synthetic origin of methamphetamine samples by  $^2\text{H}$  NMR spectroscopy.** *Analytical Chemistry* 2006;78(9):3113. [Editor's Notes: Presents the title study. The results suggest that site specific deuterium NMR can assist in classifying methamphetamine as to precursors and synthetic routes. Contact: Dipartimento di Chimica, Materiali, Ingegneria Chimica, Politecnico di Milano, I-20131 Milan, Italy.]
3. Bell SC, Oldfield LS, Shakleya DM, Petersen JL, Mercer JW. **Chemical composition and structure of the microcrystals formed between silver (I) and gamma-hydroxybutyric acid and gamma-hydroxyvaleric acid.** *Journal of Forensic Sciences* 2006;51(4):808. [Editor's Notes: The crystals from GHB and GHV were distinctly different, and this test can be used to analyze spiked beverages. Contact: Bennett Department of Chemistry, West Virginia University, 217 Clark Hall, Morgantown, WV 25606.]
4. Blackledge RD. **The identification of 1-dehydromethandrostenolone.** *Microgram Journal* 2005;3(3-4):186. [Editor's Notes: A recent steroid seizure was identified by GC/MS as 1-dehydromethandrostenolone, a positional isomer of methyltestosterone. Contact: Naval Criminal Investigative Service, Regional Forensic Laboratory, 3405 Welles St., Ste. 3, San Diego, CA 92136.]
5. Casale JF. **Assessment of the volatility (smokeability) of cocaine base containing 50 percent mannitol: Is it a smokeable form of "crack" cocaine?** *Microgram Journal* 2005;3(3-4):130. [Editor's Notes: Presents the title study. Contact: U.S. Department of Justice, Drug Enforcement Administration, Special Testing and Research Laboratory, 22624 Dulles Summit Court, Dulles, VA 20166.]
6. Casale J, Casale E, Collins M, Morello D, Cathapermal S, Panicker S. **Stable isotope analyses of heroin seized from the merchant vessel Pong Su.** *Forensic Sciences* 2006;51(3):603. [Editor's Notes: See # 7 (below) for the associated lead article on this seizure. The title exhibits were determined to be unique with respect to their origin. Contact: U.S. Drug Enforcement Administration, Special Testing and Research Laboratory, 22624 Dulles Summit Court, Dulles, VA 20166.]

7. Collins M, Casale E, Hibbert DB, Panicker S, Robertson J, Vujic S. **Chemical profiling of heroin recovered from the North Korean merchant vessel Pong Su.** Journal of Forensic Sciences 2006;51(3):597. [Editor's Notes: The heroin was classified as "unknown" in origin (that is, having a profile that did not resemble any known heroin types). Contact: Australian Forensic Drug Laboratory, National Measurement Institute, 1 Suakin St., Pymble 2067, Sydney, Australia.]
  
8. Datwyler SL, Weiblen GD. **Genetic variation in hemp and marijuana (*Cannabis sativa* L.) according to amplified fragment length polymorphisms.** Journal of Forensic Sciences 2006;51(2):371. [Editor's Notes: The results are useful in linking seizures, for source determination, and for differentiating licit and illicit cultivars of cannabis. Contact: Department of Plant Biology, University of Minnesota, 1445 Gortner Avenue, Saint Paul, MN 55108.]
  
9. Hanson AJ. **Specificity of the Duquenois-Levine and cobalt thiocyanate tests substituting methylene chloride or butyl chloride for chloroform.** Microgram Journal 2005;3(3-4):183. [Editor's Notes: Performs the named tests using methylene chloride or butyl chloride as the organic solvent. Contact: Wisconsin State Crime Laboratory - Madison, 4626 University Avenue, Madison, WI 53705.]
  
10. Kitlinski LM, Harman AL, Brousseau MM, Skinner HF. **Reduction of phenylephrine with hydriodic acid/red phosphorus or iodine/red phosphorus: 3-Hydroxy-N-methylphenethylamine.** Microgram Journal 2005;3(3-4):142. [Editor's Notes: Presents the title study (phenylephrine-containing products are replacing pseudoephedrine-containing products across the United States). Contact: U.S. Department of Justice, Drug Enforcement Administration, Southwest Laboratory, 2815 Scott Street, Vista, CA 92081.]
  
11. Knops LA, Northrop DM, Person EC. **Capillary electrophoretic analysis of phosphorus species in clandestine methamphetamine laboratory samples.** Journal of Forensic Sciences 2006;51(1):82. [Editor's Notes: Presents a CE technique that can separate a wide variety of anions (18 listed), including various phosphorus species, in illicitly prepared methamphetamine samples. Contact: Washington State Patrol, Marysville Crime Laboratory, 2700 116 Street NE, Suite P, Marysville, WA 98271.]
  
12. Koper C, Ali-Tolppa E, Bozenko Jr. JS, Dufey V, Puetz M, Weyermann C, Zrcek F. **Identification of a new amphetamine type stimulant: 3,4-methylenedioxy(2-hydroxyethyl)-amphetamine (MDHOET).** Microgram Journal 2005;3(3-4):166. [Editor's Notes: Presents the title study. Contact: Netherlands Forensic Institute, P. O. Box 24044, 2490 AA The Hague, The Netherlands.]
  
13. Li N, Shen J, Sun J, Liang L, Xu X, Lu M, Yan J. **Study on the THz spectrum of methamphetamine.** Optics Express 2005;13(18):6750. [Editor's Notes: Presents the title study. The results suggest that method can be an effective means for detecting methamphetamine. Contact: Department of Physics, Capital Normal University, Beijing, Peop. Rep. China 100037.]
  
14. Licata M, Verri P, Beduschi G. **delta-9-THC content in illicit cannabis products over the period 1997-2004 (first four months).** Annali Istituto Superiore de Sanita 2005;41(4):483. [Editor's Notes: 5227 seizures made in Modena, Italy were analyzed and classified. Contact: Servizio di Medicina Legale, Universita degli Studi, Policlinico, Modena e Reggio Emilia, Via del Pozzo 71, 41100 Modena, Italy.]

15. Lurie IS, Cox KA. **Rapid chiral separation of dextro- and levo- methorphan using capillary electrophoresis with dynamically coated capillaries.** Microgram Journal 2005;3(3-4):138. [Editor's Notes: Presents the title study. Contact: U.S. Department of Justice, Drug Enforcement Administration, Special Testing and Research Laboratory, 22624 Dulles Summit Court, Dulles, VA 20166.]
16. Lurie I, Hays P, Valentino A. **Analysis of carbohydrates in seized heroin using capillary electrophoresis.** Journal of Forensic Sciences 2006;51(1):39. [Editor's Notes: Presents the title study. Contact: U.S. Department of Justice, Drug Enforcement Administration, Special Testing and Research Laboratory, 22624 Dulles Summit Court, Dulles, VA 20166.]
17. Narechania K. **Optical properties of active pharmaceutical ingredients and illicit drugs.** Microscope 2005;53(2):55. [Editor's Notes: Focus is on new pharmaceuticals and new illicit drugs, and towards the development of a database of same. Contact: McCrone Research Institute, Chicago, IL 60616.]
18. Rodriguez WR, Allred RA. **Synthesis of trans-4-methylaminorex from norephedrine and potassium cyanate.** Microgram Journal 2005;3(3-4):154. [Editor's Notes: Presents the title study. Contact: U.S. Department of Justice, Drug Enforcement Administration, Southeast Laboratory, 5205 NW 84th Avenue, Miami, FL 33166.]
19. Rodriguez-Cruz SE. **Analysis and characterization of designer tryptamines using electrospray ionization mass spectrometry (ESI-MS).** Microgram Journal 2005;3(3-4):107. [Editor's Notes: Presents the title study on 12 "designer" tryptamines. Contact: U.S. Department of Justice, Drug Enforcement Administration, Southwest Laboratory, 2815 Scott Street, Vista, CA 92081.]
20. Rodriguez-Cruz SE. **Analysis and characterization of psilocybin and psilocin using liquid chromatography - electrospray ionization mass spectrometry (LC-ESI-MS) with collision-induced-dissociation (CID) and source-induced-dissociation (SID).** Microgram Journal 2005;3(3-4):175. [Editor's Notes: Presents the title study. Contact: U.S. Department of Justice, Drug Enforcement Administration, Southwest Laboratory, 2815 Scott Street, Vista, CA 92081.]
21. Staples EJ, Viswanathan S. **Detection of cocaine in a cargo container using a fast SAW/GC vapor analyzer.** (Proceedings) Chemical Abstracts 2006:462179q.
22. Valentino AMM, Fuentecilla K. **Levamisole: An analytical profile.** Microgram Journal 2005;3(3-4):134. [Editor's Notes: Presents the title study. Contact: U.S. Department of Justice, Drug Enforcement Administration, Northeast Laboratory, 99 10th Avenue, Suite 721, New York, NY 10011.]
23. Wang Y, Liu L, Jia J, Liao L, Wang Y. **Determination of ketamine by use of TLC and GC-MS.** Zhongguo Yiyuan Yaoxue Zazhi 2005;25(6):497. [Editor's Notes: Included analysis of morphine and heroin. Focus appears to be toxicological (not clear in abstract). This article is written in Chinese. Contact: School of Forensic Medicine, Shanxi Medical University, Taiyuan, Shanxi Province 030001, Peop. Rep. China.]
24. Xu Y, Gao Y, Wei H, Du Y, Wang E. **Field-amplified sample stacking capillary electrophoresis with electrochemiluminescence applied to the determination of illicit drugs**

**on banknotes.** Journal of Chromatography A 2006;1115:260. [Editor's Notes: Presents the title study; focus is cocaine and heroin. Baseline resolution was achieved within 6 minutes. Contact: State Key Laboratory of Electroanalytical Chemistry, Changchun Institute of Applied Chemistry, Chinese Academy of Sciences, Graduate School of the Chinese Academy of Sciences, Changchun, Jilin 130022, China.]

#### Additional References of Possible Interest:

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2. Simonov EA, Salomatin VE. **Preliminary analysis of substances of unknown origin and complex medicinal formulations.** Mikroelementy y Meditsine 2005;6(3):35. [Editor's Notes: Abstract is unclear as to what technique is used. "Narcotic materials and psychotropic substances" are mentioned. This article is written in Russian. Contact: Tsentr Sudebno-Med. Kriminal Eksp., Minist. Oborony Ross. Fed., Russia.]
3. Vredenburg MJ, Blok-Tip L, Hoogerbrugge R, Barends DM, de Kaste D. **Screening suspected counterfeit Viagra and imitations of Viagra with near-infrared spectroscopy.** Journal of Pharmaceutical and Biomedical Analysis 2006;40(4):840. [Editor's Notes: 103 samples (widely varied) were tested, and the method was found to be 98 percent accurate. Contact: National Institute for Public Health and the Environment (RIVM), P.O. Box 1, Bilthoven 3720 BA, Neth. Editor's Aside - This article was included in this month's reference list because Viagra counterfeit tablets and also Viagra mimic tablets (usually containing amphetamine or methamphetamine) have occasionally been submitted to forensic laboratories.]
4. Xu W. **Portable type explosive/drugs detector having compact structure, light weight, and convenient application.** (Patent) Chemical Abstracts 2006:509864.
5. Yuan X, Forman BM. **Detection of designer steroids.** Nuclear Receptor Signaling 2005;3:(No Page Numbers Listed). [Editor's Notes: Presents an analytical strategy that detects use of unknown designer steroids "without prior knowledge of their existence". Focus is toxicological (testing of athletes). Contact: Gene Regulation and Drug Discovery Department, Gonda Diabetes Research Center, The Beckman Research Institute, The City of Hope National Medical Center, Duarte, CA 91010.]

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## SCIENTIFIC MEETINGS

1. Title: 16th Annual CLIC Technical Training Seminar (Fourth and Final Posting)  
**Sponsoring Organization:** Clandestine Laboratory Investigating Chemists Association  
**Inclusive Dates:** September 6 - 9, 2006  
**Location:** Hong Omni Mont-Royal Hotel (Montreal, Quebec, Canada)  
**Contact Information:** See O.C. Anderson (620 / 792-4353 or carl.anderson -at- kbi.state.ks.us)  
**Website:** None Provided

In order for a Digital Evidence Laboratory to be American Society of Crime Laboratory/Laboratory Accreditation Board-*International* (ASCLD/LAB-*International*) accredited, it must have a Quality Assurance Program that is administered by a Quality Assurance Manager (QAM) and/or a Quality Assurance Program Manager (QAPM). Last month, the responsibilities and duties of the QAM and QAPM were introduced. This edition will cover some of the pro-active duties of the QAPM, including re-analysis, validation, reference collection, and controls.

### Re-Analysis

Re-analysis is an internal proficiency test, and specifically checks that two independent examiners get essentially the same results from the same evidence. The QAPM will select, at a minimum, three exhibits annually for re-analysis. Each exhibit selected for re-analysis is chosen prior to the case being completed (that is, before the report of examination is signed).

Once an exhibit has been selected for re-analysis, the QAPM will select a group supervisor to assign the case. In larger laboratories, the re-analysis is assigned to an examiner working in a different group than the examiner who conducted the original analysis. In addition, to ensure comparable results, the re-analysis is conducted at the same Tier level as the original analysis, and all original case supporting documents (i.e., search warrant, case notes, etc.) and any other information that was provided to the original examiner is also given to the examiner conducting the re-analysis. The group supervisor will notify the QAPM of the examiner he/she has selected to conduct the re-analysis.

Once the re-analysis is complete the examiner gives everything (i.e., exhibit, case notes, case folder, etc.) directly to the QAPM. The QAPM then notifies the group supervisor that their examiner has completed the re-analysis.

The QAPM reviews the findings of the re-analysis, and compares them with the original analysis. If there are any significant differences, the results (and any recommendations) are discussed with the appropriate group supervisors and the laboratory director. The results are also documented in the re-analysis file by the QAPM.

The appropriate group supervisor will review the re-analysis with their examiner. The appropriate group supervisor will forward a memo to the re-analysis file through the QAPM indicating he/she has spoken with their examiner. If any corrective action is necessary, that is also documented.

### Validation

Only validated software and hardware may be used at an accredited laboratory. Validating software and hardware involves testing them on known exhibits to demonstrate that they will perform as designed. All software tools and specialized hardware devices authorized for use in the Digital Evidence Laboratory must be validated by three different examiners, each using a



different work bench equipped with different computers and operating systems (unless not feasible). The QAPM approves all validation tests and methods prior to their use. Any deviation from the standard validation procedures requires the QAPM's approval.

Once a validation process has been completed, the validation and summary sheet will be provided to the QAPM. The QAPM reviews the test results and (if the tool performed properly) approves the tool's use. The QAPM also maintains a list of approved software and hardware devices.

Laboratory management may authorize the one-time use of a tool prior to it being validated; however, the tool must be validated prior to any further use.

### **Reference Collection**

Digital evidence reference collections consist of files or databases that are used to: 1) Identify or eliminate files that have no potential probative value (e.g., standard software programs); or 2) Identify files that are already known, and of potential probative interest (e.g., child pornography images). Reference collections are not in the public domain, but rather are issued by organizations that have authenticated the content and quality of the data.

The QAPM is responsible for maintaining the laboratory's official/licensed copy of all reference collections used in the examination of evidence, and for maintaining all supporting documentation from the collection's originator or distributor. The official/licensed copy of each reference collection is secured by the QAPM. Paper documentation is kept in a reference collection file. Where appropriate, the "hash" value of the official/licensed copies in the reference collection (consisting of only the pertinent data file(s) or database(s)) is determined by the Validation Committee and reported to the QAPM. The official/licensed standard is made available to each examiner, who will copy the needed data files into the appropriate directory of the base examination software.

### **Controls and Blanks**

Controls are yet another form of proficiency test and validation check. The QAPM is responsible for creating positive and a negative control disks. A positive control disk consists of media containing three sample files, each of which includes three different file types commonly encountered in drug investigations. A negative control (also known as a blank) consists of media that is formatted but does not contain any files. Both types of controls allow quick, standardized checks on whether software and hardware tools are performing properly. The original media is retained in the lock box of the QAPM, along with the hash value documentations.

Physical copies of the positive and negative control disks are labeled, uniquely numbered, dated, and initialed by the QAPM. These copies are provided to each examiner in "read only" format.

### **Summary**

A pro-active QAPM is critical to a Quality Assurance Program, and a Quality Assurance Program is the foundation of reliable and defensible analyses and reports.

Questions or comments? E-mail: [Steven.L.Carter -at- usdoj.gov](mailto:Steven.L.Carter-usdoj.gov)

# Microgram

## *Bulletin*

**Published by:**

The Drug Enforcement Administration  
Office of Forensic Sciences  
Washington, DC 20537

The U.S. Attorney General has determined that the publication of this periodical is necessary in the transaction of the public business required by the Department of Justice. Information, instructions, and disclaimers are published in the January issues.

- SEPTEMBER 2006 -

**- INTELLIGENCE ALERT -**

**MUSHROOMS LACED WITH GAMMA-HYDROXYBUTYRIC ACID (GHB) AT A METHAMPHETAMINE LABORATORY IN MIDWEST CITY, OKLAHOMA**

The Oklahoma State Bureau of Investigation Central Regional Laboratory (Oklahoma City) recently received a dark brown glass jar containing apparent psilocybe mushrooms (see Photo 1). The exhibit was seized at a clandestine methamphetamine laboratory by the Midwest City Police Department (Midwest City is a suburb of Oklahoma City). The mushrooms (total net mass approximately 3 grams) had the texture and odor typical of psilocybe mushrooms; however, derivatization with bis(trimethylsilyl)trifluoroacetamide (BSTFA) followed by analysis by GC and GC/MS indicated neither psilocin or psilocybin but rather *gamma*-hydroxybutyric acid (GHB; not quantitated, but a rather low loading based on the gas chromatogram). This



**Photo 1**

is the first ever submission of GHB-laced mushrooms to the laboratory.

[Editor's Notes: The analyst in this case has analyzed several dozen cases of psilocybe mushrooms, and feels that these were in fact psilocybe mushrooms that had been intentionally laced with GHB. It is unclear why the mushrooms were negative for psilocin or psilocybin.]

\* \* \* \* \*

**- INTELLIGENCE ALERT -**

**ECSTASY MIMIC TABLETS (CONTAINING *META*-CHLOROPHENYL-PIPERAZINE (mCPP)), AND CAPSULES CONTAINING 2,5-DIMETHOXY-4-IODOPHENETHYLAMINE (2C-I), IN IOWA**

The Iowa Criminalistics Laboratory (Ankeny, Iowa) recently received 44 multi-colored tablets with no logo, suspected Ecstasy (see Photo 2). The exhibits were seized by the Iowa City Police Department (circumstances unknown; Iowa City is in southeastern Iowa). Analysis of the tablets (not weighed, 9 x 3.5 millimeters) by TLC and GC/MS, however, indicated not MDMA but rather *meta*-chlorophenylpiperazine (mCPP; not quantitated, but a moderate loading based on the TIC). This is the first submission of mCPP to the laboratory.



**Photo 2**

The laboratory also recently received 6 clear capsules, each containing a small amount of white powder, submitted as an unknown/suspected controlled substance (photo not taken, but the same as those pictured in the January 2006 issue of *Microgram Bulletin* (page 3)). The exhibits were seized by the Marion Police Department (circumstances unknown; Marion is in eastern Iowa). Analysis of the powder (not weighed) by Marquis, TLC, and GC/MS indicated 2,5-dimethoxy-4-iodophenethylamine (2C-I; not quantitated but apparently high purity based on the TIC). The identification was tentative, due to the lack of a reference standard. This is the second submission of presumed 2C-I to the laboratory; the first occurred in 2004.

\* \* \* \* \*

**- INTELLIGENCE ALERT -**

**ECSTASY MIMIC TABLETS (CONTAINING *META*-CHLOROPHENYL-PIPERAZINE (mCPP)) IN FRISCO, TEXAS**

The Texas Department of Public Safety Crime Laboratory in Garland recently received 6 beige tablets and partial tablets with the Mitsubishi logo on one face and half-scored on the opposite face, resembling previously submitted Ecstasy tablets (see Photo 3, next page). The exhibits were seized by the Frisco Police Department (circumstances not provided; Frisco is a northern suburb of Dallas). Analysis of the tablets (total net mass of intact and partial tablets 1.70 grams) by color tests, UV, and GC/MS, however, indicated not MDMA but rather *meta*-chlorophenyl-



**Photo 3**

piperazine (mCPP; not quantitated but a moderate loading based on the TIC). This was the first submission of mCPP to the laboratory.

\* \* \* \* \*

**- INTELLIGENCE BRIEF -**

**DEGRADED KHAT (FROM PARIS, FRANCE) AT THE NORTHERN KENTUCKY/CINCINNATI AIRPORT, KENTUCKY**

The Kentucky State Police Northern Regional Laboratory (Cold Spring) recently received 75 bundles of apparent khat (see Photo 4). Each bundle contained 4 smaller sub-bundles, and was wrapped in the standard manner, in a large leaf secured with a husk-like twine. The exhibits (total net mass approximately 13 pounds) had been shipped in a cardboard box from Paris, France to the Northern Kentucky/Cincinnati Regional Airport, and were seized by U.S. Customs and Border Protection agents. Unusually, there was no effort to cool the material during shipping, and it had a moist and distinctly wilted appearance, with signs of mold, upon receipt at the laboratory. Analysis of extracts by GC and GC/MS indicated no cathinone, but confirmed cathine (not quantitated). It was estimated that the package had been in transit for at least 14 days prior to its seizure, explaining its degraded appearance and complete loss of cathinone. This is the second submission of khat to the laboratory; the first was submitted approximately 5 years ago. Cathine is a Schedule IV controlled substance under Kentucky law.



**Photo 4**

\* \* \* \* \*



**- INTELLIGENCE ALERT -**

**WALL HANGINGS CONTAINING COCAINE FROM GUATEMALA  
AT MIAMI AIRPORT, FLORIDA**

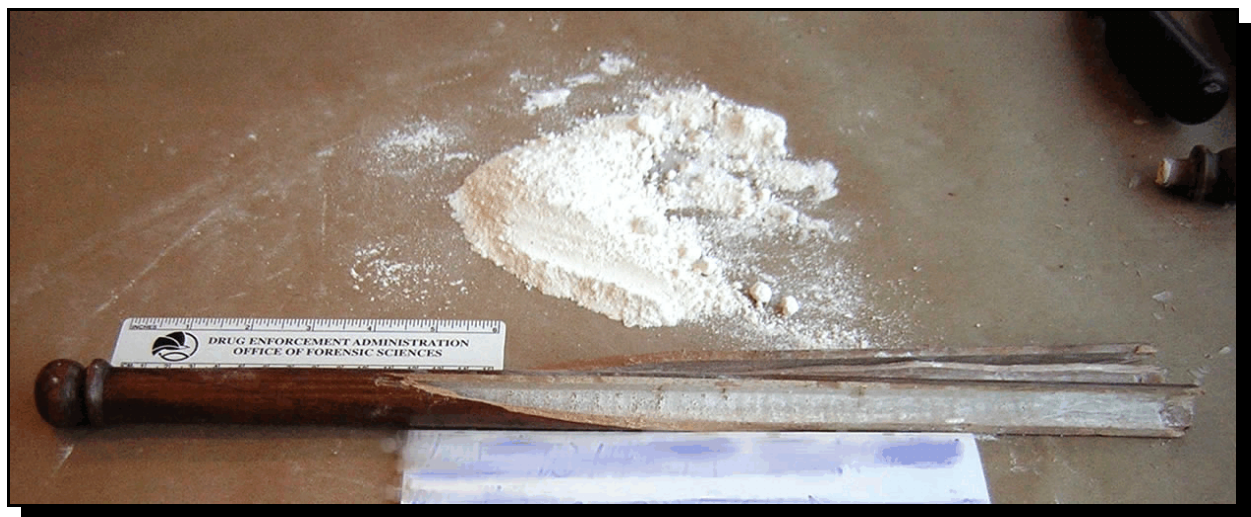
The DEA Mid-Atlantic Laboratory (Largo, Maryland) recently received 7 multicolored fabric wall hangings with wooden dowels at each end (see Photos 5 and 6). The dowels were hollowed out, and contained white powders, suspected cocaine (see Photo 7). The exhibits were seized by Immigration and Customs Enforcement personnel from a parcel service flight from Guatemala to Miami, and were submitted to the laboratory after a controlled delivery in the mid-Atlantic region (details not available). The dowels were 18 inches long by about 1 ½ inches in diameter, and were outfitted with end caps which appeared to be glued on. Analysis of the powder (total net mass 439.3 grams) by GC, MS, and IR confirmed 90 percent cocaine hydrochloride. This was the Mid-Atlantic Laboratory's first encounter with this smuggling technique.



**Photo 5**



**Photo 6**



**Photo 7**

\* \* \* \* \*

**- INTELLIGENCE ALERT -**

**POLYDRUG SEIZURE (MDMA POWDER, ECSTASY TABLETS,  
QUAALUDE MIMIC TABLETS (CONTAINING DIAZEPAM), AND MARIJUANA)  
NEAR OROVILLE, WASHINGTON**



**Photo 8**

The DEA Western Laboratory (San Francisco, California) recently received a polydrug seizure including: A) 5 boxes each containing 12 food saver plastic bags of white powder, suspected methamphetamine (see Photo 8); B) 30,004 red tablets with an infinity logo, suspected MDMA (no photo); C) 10,890 white tablets with a Lemmon 714 logo on one face and half-scored on the opposite face, apparent Quaalude tablets (no photo); and D) 477 grams of plant material, suspected marijuana (no photo). The exhibits were seized near the U.S./Canadian border by agents from the U.S. Border Patrol Office in Oroville, Washington (circumstances not provided). Analysis of the powder (total net mass 59.57 kilograms) by FTIR and GC/MS indicated not methamphetamine but rather 86 percent MDMA hydrochloride. Analysis of the red/infinity logo tablets by GC, GC/MS, and GC/IRD confirmed MDMA hydrochloride (94 milligrams/tablets). Analysis of the white/Lemmon 714 logo tablets by GC, GC/MS, and GC/IRD indicated not methaqualone but rather diazepam (39 milligrams/tablet). Analysis of the plant material by microscopy, Duquenois-Levine, TLC, and GC/MS confirmed marijuana. This was the largest ever submission of powdered MDMA hydrochloride to the Western Laboratory.

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**- INTELLIGENCE BRIEF -**

**PCP LABORATORY IN SOUTH HOLLAND, ILLINOIS**

The DEA North Central Laboratory (Chicago, Illinois) recently assisted the DEA Chicago Field Division, the South Chicago HIDTA Task Force, and the South Holland, Illinois Fire Department in the seizure of a clandestine phencyclidine (PCP) laboratory located in a house in South Holland (a suburb of Chicago). The laboratory was inactive at the time of its seizure, and appeared to primarily be a storage site for chemicals used in the synthesis of PCP, as well as for PCP base which had not been extracted from reaction mixtures. However, sales of PCP were active and ongoing prior to the raid. Chemicals found at the site included 2 unlabeled one-gallon



cans of cyclohexylamine, 4 gallons of cyclohexanone, approximately 4 gallons of ether, and 50 pounds of white powder (analysis by FTIR and uranyl acetate microcrystalline test identified the latter substance as potassium cyanide). Also recovered at the residence were 73 two-quart mason jars containing bi-layered liquids with volumes varying between 200 - 500 milliliters. Analysis of the top (organic) layers by GC/MSD indicated cyclohexanone, bromobenzene, cyclohexylpiperidine, biphenyl, 1-piperidinocyclohexene, PCC, and PCP. Analysis of chloroform extracts of the lower (aqueous) layers by GC/MSD indicated residual amounts of the same compounds identified in the organic layers. The search also recovered printed Internet procedures for the preparation of Grignard reagents. This is the first PCP lab which the North Central Laboratory has responded to in over 2.5 years. Followup investigations determined that the lab had been in operation for about 2 years, and that the cyclohexylamine was purchased in error by the laboratory operators (who mistakenly believed it could be used to manufacture PCP).

\* \* \* \* \*

## SELECTED REFERENCES

[Selected references are a compilation of recent publications of presumed interest to forensic chemists. Unless otherwise stated, all listed citations are published in English. Abbreviated mailing address information duplicates that provided by the abstracting service. Patents and Proceedings are reported only by their *Chemical Abstracts* citation number.]

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2. Carter JF, Sleeman R, Hill JC, Idoine F, Titterton EL. **Isotope ratio mass spectrometry as a tool for forensic investigation (examples from recent studies).** Science & Justice 2005;45(3):141. [Editor's Notes: An overview and minor review. Includes Ecstasy tablets and heroin samples as examples. Contact: Mass Spec Analytical Ltd., Filton, Bristol BS99 7AR, UK.]
3. Hanna GM. **NMR regulatory analysis: Enantiomeric purity determination for R-(-)-desoxyephedrine and antipode methamphetamine.** Pharmazie 2006;61(3):188. [Editor's Notes: The title study was performed using a 400 MHz NMR and a chiral solvating agent (not specified in the abstract). The purpose was to determine the enantiomeric purity of R-(-)-methamphetamine in nasal decongestant sprays. Contact: Northeast Regional Laboratory, Food and Drug Administration, Jamaica, NY 11435-1034.]
4. Jiang D, Wei Y, Zhao G, Cheng C. **Research of IMS technology and its application in narcotic drugs and explosives detection.** Tongweisu 2005;18(1-2):51. [Editor's Notes: Narcotics and explosives were not specified in the abstract. This article is written in Chinese. Contact: Shanghai Institute of Applied Physics, Chinese Academy of Sciences, Shanghai 201800, Peop. Rep. China.]
5. Kitlinski LM, Harman AL, Brousseau MM, Skinner HF. **Reduction of phenylephrine via hydriodic acid - red phosphorus or iodine - red phosphorus: 3-Hydroxy-N-methylphen-**

- ethylamine.** Journal of the Clandestine Laboratory Investigating Chemists Association 2006;16(3):12. [Editor's Notes: Presents the title study (phenylephrine-containing products are replacing pseudoephedrine-containing products across the United States). *JCLICA* is a law enforcement restricted journal. A slightly different version of this article was co-published in: *Microgram Journal* 2005;3(3-4):142. Contact: U.S. Department of Justice, Drug Enforcement Administration, Southwest Laboratory, 2815 Scott Street, Vista, CA 92081.]
6. Kuwayama K, Tsujikawa K, Miyaguchi H, Kanamori T, Iwata Y, Inoue H, Saitoh S, Kishi T. **Identification of impurities and the statistical classification of methamphetamine using headspace solid phase microextraction and gas chromatography - mass spectrometry.** Forensic Science International 2006;160(1):44. [Editor's Notes: The title techniques can be used for impurity profiling and discrimination. Contact: First Chemistry Section, National Research Institute of Police Science, 6-3-1, Kashiwanoha, Kashiwa-shi, Chiba 277-0882, Japan.]
  7. McFadden K, Gillespie J, Carney B, O'Driscoll D. **Development and application of a high-performance liquid chromatography methods using monolithic columns for the analysis of ecstasy tablets.** Journal of Chromatography A 2006;1120(1-2):54. [Editor's Notes: Presents the title study. "A large number of Ecstasy tablets seized in Ireland" were analyzed. Contact: Science Research Department, Letterkenny Institute of Technology, Donegal, Ire.]
  8. Nerkiş S, Oruc HH. **Determination of amounts of the active substance and added substances in cannabis, heroin, and ecstasy tablets used in Bursa and in the Bursa region.** Bagimlilik Dergisi 2006;7(1):11. [Editor's Notes: 21 Cannabis, 55 heroin, and 65 Ecstasy tablet exhibits were characterized by GC/MS and FTIR. This article is written in Turkish. Contact: Bursa Leg. Med. Soc., Turk.]
  9. Person EC, Savopolos JA. **Elemental identification of lithium in clandestine laboratory casework by atomic emission spectroscopy.** Journal of the Clandestine Laboratory Investigating Chemists Association 2006;16(3):23. [Editor's Notes: Presents the title study. *JCLICA* is a law enforcement restricted journal. Contact: Department of Forensic/Analytical Chemistry, California State University, Fresno, 2555 East San Ramon Ave., SB/70, Fresno, CA 93740.]
  10. Poortman-Van Der Meer A. **The synthesis of MDMA with NaBH<sub>4</sub> as the reducing agent; the "Cold Method."** Journal of the Clandestine Laboratory Investigating Chemists Association 2006;16(3):10. [Editor's Notes: Details withheld in accordance with *Microgram* policy. *JCLICA* is a law enforcement restricted journal. Contact: Netherlands Forensic Institute, Postbus 24044 The Hague, The Netherlands.]
  11. Sasaki T, Makino Y. **Effective injection in pulsed splitless mode for impurity profiling of methamphetamine crystal by GC or GC/MS.** Forensic Science International 2006;160(1):1. [Editor's Notes: 48 samples were analyzed. The technique minimized thermal decomposition, and the results can be used for impurity profiling and discrimination. Contact: Entest Japan, 7-13-8 Higashi Shinkoiwa, Katsushika-ku, Tokyo 124-0023, Japan.]
  12. Shibuya EK, Souza-Sarkis JE, Negrini-Neto O, Moreira MZ, Victoria RL. **Sourcing Brazilian marijuana by applying IRMS analysis to seized samples.** Forensic Science International 2006;160(1):35. [Editor's Notes: The results allowed differentiation of marijuana grown in dry versus wet areas of Brazil. Contact: Laboratorio de Caracterizacao Quimica e Isotopica, Centro de Quimica e Meio Ambiente, Instituto de Pesquisas Energeticas e Nucleares, IPEN/CNEN-SP, Av. Lineu Prestes 2242, Cidade Universitaria, Sao Paulo, SP CEP 05508-900, Brazil.]

13. Tanner-Smith EE. **Pharmacological content of tablets sold as “Ecstasy”: Results from an online testing service.** Drug and Alcohol Dependence 2006;83:247. [Editor’s Notes: Presents the title study and results. Tablets were submitted anonymously, from 1999 to 2005. Contact: Department of Sociology, VU Station B Box 351811, 2301 Vanderbilt Place, Vanderbilt University, Nashville, TN 37235-1811.]

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## SCIENTIFIC MEETINGS

**1. Title: 32nd Annual NEAFS Meeting**

(Third and Final Bimonthly Posting)

**Sponsoring Organization:** Northeastern Association of Forensic Sciences

**Inclusive Dates:** November 1 - 4, 2006

**Location:** Tarrytown DoubleTree Hotel (Westchester County, New York)

**Contact Information:** E. Schwartz (914 / 231-1810 or [ess6-at-westchestergov.com](mailto:ess6-at-westchestergov.com))

**Website:** None Provided

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## NEW EMAIL ADDRESSES NEEDED

The email addresses for the following organizations returned rejection notices to the *Microgram* Editor for at least the past three issues of *Microgram Bulletin*, and therefore the respective organizations have been dropped from the subscription list. Note that the errors include “mailbox full”, “over quota”, “user not found”, or “user unknown” messages, and also a variety of anti-spam/filtering rejection messages (the latter likely resulting from failure to “whitelist” the [microgram\\_editor@mailsnare.net](mailto:microgram_editor@mailsnare.net) address). The *Microgram* Editor requests your assistance in contacting these organizations, determining if they wish to remain on the *Microgram* subscription e-net, and if so asking them to forward a valid email address to the [microgram\\_editor@mailsnare.net](mailto:microgram_editor@mailsnare.net) address. In addition, if the Office has closed or is known to be no longer interested, please forward that information to the *Microgram* Editor.

### **U.S. Subscribers (by State):**

Colorado - Grand Junction Police Department Laboratory;

Florida - St. Cloud Police Department;

Indiana - LaPorte City Police Department;

Kansas - Kansas Bureau of Investigation/Pittsburg Laboratory;

New Jersey - Franklin Township Police;

Texas - Fort Worth Police Department/Crime Laboratory.

### **Non-U.S. Subscribers (by Country):**

Switzerland - Stadpolizei Zurich;

United Kingdom - Strathclyde Police Headquarters (Glasgow, Scotland);

Uruguay - Prefectura Nacional Naval (Montevideo).

The rapid rate of change in computer technology is a continuous challenge for digital evidence examiners. In most cases, these changes are technical improvements in software or hardware. More recently, however, the fallout from a non-technological issue is creating a significant operational challenge for digital evidence examiners, that being **information security**. The loss and/or criminal mis-use of personal information has rapidly become a paramount issue for both individuals and organizations. In an effort to combat the problem, many digital technology users have implemented some form (or forms) of information security. This represents a major shift in public attitudes and behavior - five years ago, protecting personal information was (on average) a low priority for users - but now it is a major concern.

One of the better-known forms of information security is data encryption, which is generally defined as "the process of obscuring information to make it unreadable without special knowledge." To read encrypted data, you must provide a key or password that allows it to be decrypted. Data encryption has been around for many years, as evidenced by the numerous software and hardware products that are currently available to perform it. As noted above, however, until recently encryption was not commonly utilized by most users.

While both software and hardware encryption protocols present unique problems for computer forensic examiners, this article will only focus on the issues presented by a specialized "pseudo-encryption" technique - the "security mode feature set" found on most modern hard disks that have an Advanced Technology Attachment (ATA) interface. The "security mode feature set" is a hard disk firmware-implemented password lock that was first defined in the ATA-3 Interface standard published in 1997 as American National Standards Institute (ANSI) standard X3.298-1997. Since that date, nearly all manufactured ATA hard disks (such as Integrated Device Electronics (IDE, also known as Parallel ATA or P-ATA), and Serial ATA) have had this capability built in, but until recently it has been only rarely used. "The security mode feature allows a host [that is, the computer] to implement a security password system to prevent unauthorized access to the internal disk drive" (<http://www.t13.org>). Support of this feature is indicated in Word 128 of the Identify Device response command, which enables the host to receive parameter information from the internal disk drive during the boot sequence.

Many subject matter experts do not believe that this security feature is a true encryption protocol, because it does not actually encrypt the information on the disk; rather, it makes the disk inaccessible until the proper password is provided. However, it does meet the basic definition, since the information cannot be read without the password.

The "security mode feature set" uses two independent 32-byte passwords, one "user" and one "master," and specifies one of two security modes - "high" and "maximum." Each password must be at least 4 characters in length. The "user" password enables the security feature, blocking access to all user data on the hard disk. The "master" password can be used to unlock the hard disk if the "user" password is lost or if an administrator requires access. Providing an incorrect "user" or "master" password does nothing to the hard disk or the information it contains; rather, the hard disk cannot be accessed until the correct password is entered. A password ("user" or "master") can only be provided a maximum of five times before the system must be reset or power-cycled. The passwords can be set using either the system's Basic Integrated Operating System (BIOS) or with third party tools.

The security mode dictates whether the "master" password is used only to "unlock" the hard disk and access the data ("high"), or instead is used to "unlock" the hard disk and wipe the data ("maximum"). That is, use of the "master" password when the security mode is set to "maximum" will prompt the computer to erase all the information by writing zeros onto all sectors of the hard disk before allowing access to it - a fatal error for a digital evidence examiner. Because this action destroys the data (including any potential evidence), the examiner must first determine the security mode before even thinking about applying the "master" password, and obviously the examiner can never use the master password if the security mode is set to "maximum." The security mode cannot be either determined or set in the BIOS, and therefore only third party disk utility software can be used. The level is set to "high" by default.

The passwords and large sections of the hard disk's firmware are stored on the non-user accessible service area of the disk, and not on the controller card or mother board. Therefore, when a hard disk password is set, it travels with the device, so the disk is protected even if it is placed in another computer. This means that the password cannot be bypassed by replacing the controller card, or by removing the complementary-symmetry/metal-oxide semiconductor (CMOS) battery, or by adjusting jumper settings to "reset" it.

When engaged, the "security mode feature set" presents digital evidence examiners with some interesting challenges - the first being determining whether the hard disk is password protected, and the second being determining what security mode is set, "high" or "maximum." Knowing which password was used to lock the disk is not critical, as either will grant access to the data. However, as noted above, knowing what security mode is set is of paramount importance, as utilizing the "master" password when the security mode is set to "maximum" will result in complete loss of the data.

Obviously, if the disk is password protected in this manner, it is not possible to obtain a usable image (copy) for forensic analysis without providing the password, or bypassing it.

### **Determining the Security Status of a Disk**

If the hard disk is removed from a computer and attached to a forensic examination system via a write-blocking device it may or may not prompt for a password. Forensic software may be able to obtain an image, but it will not be exploitable. The problem will be apparent when the examiner notes that the disk is identified as "unused disk space" despite the fact it appears to contain a large amount of random characters that span a significant portion of the disk. This is different than a hard disk that presents itself as "unallocated disk space," which usually indicates some sort of proprietary hardware issue (frequently encountered with laptop systems). Either scenario can be identified by either previewing the disk prior to imaging or by utilizing diagnostic software or other similar specialized third party tools that are designed to identify a disk's security status. If the preview identifies the disk as "unused disk space" or "unallocated disk space", diagnostic software must be used to determine whether or not it is locked. If the disk is locked, the "security mode feature set" has been activated. If the disk is not locked, a hardware proprietary issue is more likely; this can be overcome by obtaining an image using a forensic or controlled boot disk. [Note: Caution must be exercised when using diagnostic software or other third party tools, as they may not be forensically sound and might alter the disk's contents.]

As noted above, the password is stored on the hard drive itself, which means it cannot be bypassed by replacing the controller card, by flashing the memory chip, by transferring the hard disk to another computer, or by running a "brute force" password cracking attack against it (the latter approach is impractical because of the security feature's maximum five attempts per power-cycle limit). However, there are still a few approaches that can be used to obtain the password, the first of which is getting it directly from the computer system owner/user. This of course is only effective if the owner/user is cooperative and was responsible for setting the password. As always, caution should be used when utilizing any information obtained from a perceived cooperating witness, as they may actually be providing false information intended to corrupt or mislead; for example, providing the master password

and stating that the security mode is set to high when it is actually set to maximum. Any information obtained from a witness should be verified before it is used. The second method involves conducting a search for the password around the computer itself. Many individuals write their passwords down on a piece of paper and keep it close to their computer. Whether it is, e.g., taped to the monitor, hidden under the keyboard, or stored in a file, it is definitely worthwhile to conduct an extensive search of the area surrounding the computer. This information could also be malicious, and therefore it (like witness statements) also has to be verified prior to use. The third method involves enlisting the assistance of the hard disk's manufacturer (such as Seagate, Western Digital, or Hitachi) or the computer system's manufacturer (such as Dell, Gateway, and Hewlett Packard). According to the ATA-3 specification, "the Master Password shall be set to a vendor specific value during manufacturing and the lock function disabled." This original password can also be reset by a computer system manufacturer, which means it may be possible to obtain the "master" password by coordinating with the hard disk's or computer system's manufacturer. Most reputable manufacturers have no problem assisting law enforcement with these types of requests, but they will require specific information such as serial, model, and product numbers for the targeted computer system and/or hard disk, and they may require a subpoena before they release any passwords. Once again, however, it is critical to remember that the "master" password cannot be used if the security mode has been set to "maximum".

The last method requires specialized forensic hardware that is designed to intercept the boot sequence, access the hard disk, and obtain the stored password. This method is used by a few digital forensics units and data recovery companies; unfortunately, it is currently very expensive. Digital forensics units without this technology should conduct extensive research into its cost effectiveness before pursuing this solution. Should purchasing this solution prove not to be feasible, an alternative is to coordinate with either larger digital forensics units or data recovery companies for assistance.

Once the password has been provided, the examiner is granted access to the hard disk, and it functions as any other hard disk would - until it is shut down. Shutdown reactivates the security feature, requiring the password to be re-entered upon restarting. The feature can be deactivated using either the BIOS or third party tools, but this is not a proper option for a digital forensic examiner, as the disk is evidence and should be write-blocked. Additionally, the image that is obtained will not be affected by the security feature as long as it is processed using forensic software.

As stated above, the security feature does not encrypt the disk's content - it merely prevents access. If the disk's contents are encrypted, once you access the disk you will either be prompted for another password as the computer's operating system initiates, or you will only be granted access to a generic desktop and have to initiate a decryption algorithm (which will require yet another password), in order to view the disk's contents. The details of disk encryption issues will be discussed in future articles.

As you can see the "security mode feature set" does make a computer forensic examiner's job a little more complicated, but it is nothing that a well-trained examiner cannot overcome. Additional information about this feature can be found at: <http://t13.org/project/d2008r7b-ATA-3.pdf>

Questions or comments? E-mail: [Clayton.D.Schilling-usdoj.gov](mailto:Clayton.D.Schilling-usdoj.gov)

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# Microgram

## *Bulletin*

**Published by:**

The Drug Enforcement Administration  
Office of Forensic Sciences  
Washington, DC 20537

The U.S. Attorney General has determined that the publication of this periodical is necessary in the transaction of the public business required by the Department of Justice. Information, instructions, and disclaimers are published in the January issues.

- OCTOBER 2006 -

**- INTELLIGENCE ALERT -**

**ECSTASY MIMIC TABLETS CONTAINING 1-(3-CHLOROPHENYL)-  
PIPERAZINE (mCPP) IN VERNON HILLS, ILLINOIS**

The Northeastern Illinois Regional Crime Laboratory (Vernon Hills) recently received 140 mottled tablets with a “shark” logo on one face and half-scored on the opposite face, suspected MDMA (see Photo 1). The exhibits were seized in Vernon Hills by the Lake County Metropolitan Enforcement Group (details sensitive). Analysis of the tablets (total net mass about 42 grams) by Marquis and Mecke color testing and GC/MS, however, indicated only trace MDMA (not confirmed) and 1-(3-chloro-phenyl)piperazine (mCPP; not quantitated but a high loading based on the TIC). mCPP

is a metabolite of trazodone (an antidepressant), and is not controlled in Illinois; however, it is being increasingly encountered as a MDMA-mimicking compound. This was the first submission of mCPP, and also the first ever submission of “shark” logo tablets, to the laboratory.



**Photo 1**

**- INTELLIGENCE ALERT -**

**IMPRINTED METHAMPHETAMINE BRICKS AT THE  
SAN YSIDRO, CALIFORNIA PORT OF ENTRY**

The DEA Southwest Laboratory (Vista, California) recently received two separate but similar sets of bricks of a highly compressed, off-white substance, all suspected methamphetamine. The first submission contained eight bricks, all imprinted with a stylized “X” logo (see Photo 2), whereas the second submission contained ten bricks, all imprinted with a rather crudely formed six-pointed “Star” (roughly similar to a Star of David; see Photo 3). The exhibits were all seized by Immigration and Customs Enforcement personnel from two different vehicles entering at the San Ysidro Port of Entry (San Diego); in both cases, the bricks were concealed in the vehicle’s spare tire. The bricks were similar in dimensions to standard cocaine kilogram bricks, and were also wrapped in multiple layers of plastic in the same manner typically seen with cocaine bricks; however, they were moist with solvent (odor of acetone and toluene), and weighed between 1.4 and 1.5 kilograms each when received (approximately 5 - 10 percent of this weight was lost on drying). Analysis of the eight-brick seizure (total net mass 10.81 kilograms dry weight) by FTIR-ATR, LC, and GC (both direct and after TPC derivatization) confirmed 99 percent d-methamphetamine hydrochloride. Analysis of the ten-brick seizure (total net mass 13.46 kilograms dry weight) by the same techniques confirmed 98 percent d-methamphetamine hydrochloride. Analysis of the solvent by Headspace-GC/MS confirmed a mixture of acetone and toluene. These were the first submissions of methamphetamine formed, imprinted, and packaged like cocaine to the Southwest Laboratory (previous submissions of rectangular packages of crystalline methamphetamine were contained in rigid containers (plastic, wood, or similar materials), not compressed and imprinted).

[Editor’s Notes: The DEA South Central Laboratory (Dallas, Texas) received two separate submissions of “methamphetamine bricks” in 2006; however, in both cases the bricks were not high purity, were not imprinted with logos, and were much thinner than typical cocaine bricks. To date, these appear to be the only similar such submissions to the DEA laboratory system.]



**Photo 2**



**Photo 3**

**- INTELLIGENCE ALERT -**

**METHAMPHETAMINE SOLUTIONS IN LARGE TEQUILA BOTTLES  
AT THE LAREDO, TEXAS PORT OF ENTRY**

The DEA South Central Laboratory (Dallas, Texas) recently received three 3-liter tequila bottles each containing a golden brown liquid, suspected to be a solution of cocaine (see Photo 4). The exhibits were seized by Customs and Border Protection officers from a vehicle entering at the Laredo, Texas Point of Entry (no further details). Analysis of the liquid (total net volume 9,136 milliliters) by GC/MS, FTIR, and HPLC, however, indicated not cocaine but rather 41 percent methamphetamine hydrochloride (equivalent to 3.78 kilograms total net mass) and dimethyl sulfone (not quantitated). The liquid had the characteristic odor of tequila, but was not formally identified. This was the first such submission to the South Central Laboratory.



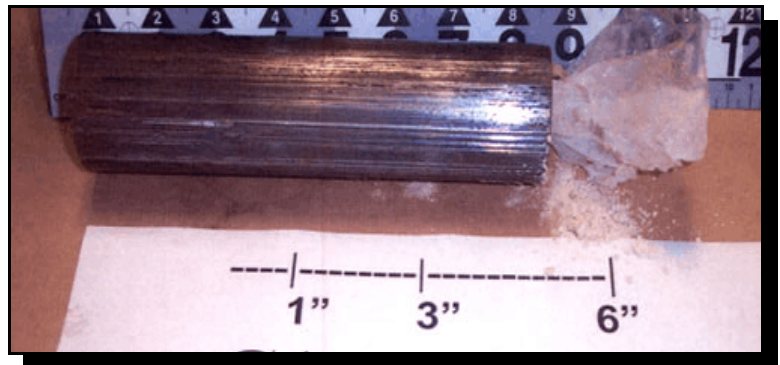
**Photo 4**

\* \* \* \* \*

**- INTELLIGENCE BRIEF -**

**HEROIN IN METAL PIPE SECTIONS IN DORAL (MIAMI), FLORIDA**

The DEA Southeast Laboratory (Miami, Florida) recently received 47 metal pipe sections each containing a plastic-wrapped package of light beige powder, suspected heroin (see Photo 5). The exhibits were seized by agents from the DEA Miami Field Division while executing a consent search at a warehouse in Doral (a suburb of Miami). The pipe sections were substitute



**Photo 5**

“pins” for the bushings of a very heavy duty tractor chain (see Photo 6, next page). Each “pin” was approximately 7.5 inches long by 2 inches in diameter, contained about 300 grams of powder, and had been sealed on both ends with a gray epoxy resin. Analysis of the powder (total net mass 14.21 kilograms) by GC/FID, GC/MS, and FTIR confirmed 90 percent heroin hydrochloride. This is the second known submission to the Southeast Laboratory of heroin concealed in pipes; the first case was in 1995 (details of the latter case are no longer available).





**Photo 6**

\* \* \* \* \*

# **- INTELLIGENCE ALERT -**

## **HEROIN “HOCKEY PUCKS” IN NEW JERSEY**

The DEA Northeast Laboratory (New York, New York) recently received four disks of highly compressed, tan powder wrapped in green or white colored plastic, each having imprinted logos on both their front and back faces, suspected heroin (see Photo 7). The exhibits were seized at a location in New Jersey by the DEA Newark Field Division (details sensitive). Because of their unusual form and dimensions (3.75 inches in diameter by 1.5 inches in width), these type of exhibits are sometimes referred to as “hockey pucks.” The logos on the front faces appeared to be negative impressions of poker chips (one “Star” logo and three “Cards” logo, respectively), while all four had a negative impression of what appears to be a “Leo” medallion on their back faces (see Photos 8 - 10, next page; note that the colors are not true). Analysis of the powder (total net mass 997.8 grams) by GC/FID, GC/MS, LC/MS, NMR, and FTIR-ATR confirmed 57 percent heroin hydrochloride, adulterated with thiamine, lidocaine, procaine, and creatine. This is the second submission of “hockey pucks” to the Northeast Laboratory in the past six months; the first such submission was made by the New England Field Division (no further details).



**Photo 7**



Photo 8



Photo 9



Photo 10

\* \* \* \* \*

## SELECTED REFERENCES

[Selected references are a compilation of recent publications of presumed interest to forensic chemists. Unless otherwise stated, all listed citations are published in English. Abbreviated mailing address information duplicates that provided by the abstracting service. Patents and Proceedings are reported only by their *Chemical Abstracts* citation number.]

1. Abbasi K, Bhanger MI, Khuhawar MY. **Capillary gas chromatographic determination of phenylpropanolamine in pharmaceutical preparation.** Journal of Pharmaceutical and Biomedical Analysis 2006;41(3):998. [Editor's Notes: Trifluoroacetylacetone was used as a derivatizing reagent. The method was used for analysis of two different tablets. Contact: Univ Sindh, Dr MA Kazi Inst Chem, Jamshoro, Pakistan.]
2. Capella-Peiro ME, Bose D, Rubert MF, Esteve-Romero J. **Optimization of a capillary zone electrophoresis method by using a central composite factorial design for the determination of codeine and paracetamol in pharmaceuticals.** Journal of Chromatography B - Analytical Technologies in the Biomedical and Life Sciences 2006;839(1-2):95. [Editor's Notes: Presents the title study; analyses could be done in less than 3 minutes. Contact: Univ Jaume I, Area Quim Analit, Castellon de La Plana 12080, Spain.]
3. Dinc E, Ozdemir A, Aksoy H, Ustundag O, Baleanu D. **Chemometric determination of naproxen sodium and pseudoephedrine hydrochloride in tablets by HPLC.** Chemical & Pharmaceutical Bulletin 2006;54(4):415. [Editor's Notes: PDA detection was used, and the results were compared versus a standard HPLC method. Contact: Ankara Univ, Fac Pharm, Dept Analyt Chem, TR-06100 Ankara, Turkey.]
4. Dresen S, Kempf J, Weinmann W. **Electrospray-ionization MS/MS library of drugs as database for method development and drug identification.** Forensic Science International 2006;161:86. [Editor's Notes: Includes 800 compounds, including many controlled substances. The data files have been posted on-line as .pdf documents. Contact: Institute of Forensic Medicine, Forensic Toxicology, University Hospital, Albertstrasse 9, D-79104 Freiburg, Germany.]
5. ElGindy A, Emara S, Mostafa A. **Application and validation of chemometrics-assisted spectrophotometry and liquid chromatography for the simultaneous determination of six-**

- component pharmaceuticals.** Journal of Pharmaceutical and Biomedical Analysis 2006;41(2):421. [Editor's Notes: Pharmaceuticals included theophylline, guaifenesin, diphenhydramine, methylparaben, propylparaben, and sodium benzoate in a syrup. Detection/quantitation at 222 nm. Contact: Suez Canal Univ, Fac Pharm, Pharmaceut Analyt Chem Dept, Ismailia 41522, Egypt.]
6. Ilias Y, Bieri S, Christen P, Veuthey JL. **Evaluation of solid-phase microextraction desorption parameters for fast GC analysis of cocaine in coca leaves.** Journal of Chromatographic Science 2006;44(7):394. [Editor's Notes: Abstract unavailable. Contact: Univ Geneva, Univ Lausanne, Sch Pharmaceut Sci EPGL, Lab Pharmaceut Analyt Chem, 20 Bd Yvoy, CH-1211, Geneva 4, Switzerland.]
  7. Iwata YT, Inoue H, Kuwayama K, Kanamori T, Tsujikawa K, Miyaguchi H, Kishi T. **Forensic application of chiral separation of amphetamine-type stimulants to impurity analysis of seized methamphetamine by capillary electrophoresis.** Forensic Science International 2006;161:92. [Editor's Notes: A highly sulfated gamma-cyclodextrin was used as the chiral selector. Contact: National Research Institute of Police Science, 6-3-1 Kashiwanoha, Kashiwa, Chiba 277-0882, Japan.]
  8. Kochana J, Parczewski A, Wilamowski J. **SPE/TLC profiling of the impurities of MDMA: The influence of agglutinants, diluents, and adulterants.** Journal of Liquid Chromatography & Related Technologies 2006;29(9):1247. [Editor's Notes: Presents the title study. Contact: Jagiellonian Univ, Dept Analyt Chem, Fac Chem, Ingardena 3, PL-30060 Krakow, Poland.]
  9. Lee JS, Han EY, Lee SY, Kim EM, Park YH, Lim MA, Cgung HS, Park JH. **Analysis of the impurities in the methamphetamine synthesized by three different methods from ephedrine and pseudoephedrine.** Forensic Science International 2006;161:209. [Editor's Notes: Impurity profiling was conducted on 16 different samples using GC/FID and GC/MS. The results were able to differentiate samples produced via the chloroephedrine, HI/red P, and I<sub>2</sub>/red P/H<sub>2</sub>O routes. Contact: Research Institute of Pharmaceutical Sciences, College of Pharmacy, Seoul National University, Seoul 151-742, Republic of Korea.]
  10. Meng P, Fang N, Wang M, Liu H, Chen DDY. **Analysis of amphetamine, methamphetamine, and methylenedioxymethamphetamine by micellar capillary electrophoresis using cation-selective exhaustive injection.** Electrophoresis 2006;27:3210. [Editor's Notes: CSEI is used as an on-line concentration method; in this case, sensitivity was increased 1000-fold versus standard capillary MEKC. Contact: Department of Chemistry, University of British Columbia, 2036 Nain Mall, Vancouver V6T 1Z1, Canada.]
  10. Mohamed R, Gremaud E, Richoz-Payot J, Tabet JC, Guy PA. **Quantitative determination of five ergot alkaloids in rye flour by liquid chromatography - electrospray ionisation tandem mass spectrometry.** Journal of Chromatography A 2006;1114(1):62. [Editor's Notes: The target alkaloids were ergocristine, ergotamine, ergonovine, ergocornine, and ergokryptine; 15 samples of rye flour were analyzed. Contact: Nestec Ltd, Nestle Res Ctr, Dept Qual & Safety Assurance, Vers Chez Les Blanc, POB 44, CH-1000 Lausanne 26, Switzerland.]
  11. Schmidt AH. **Validated HPLC method for the determination of residues of acetaminophen, caffeine, and codeine phosphate on swabs collected from pharmaceutical manufacturing equipment in support of cleaning validation.** Journal of Liquid Chromatography & Related Technologies 2006;29(11):1663. [Editor's Notes: Presents the title study. Contact: Steiner & Co, Deutsch Arzneimittel Gessell, Ostpreussendamm 72-74, D-12207 Berlin, Germany.]



12. Stefan-van-Staden RI, Lai B. **Enantioselective, potentiometric carbon paste electrodes based on C-60 derivatives as chiral selectors for the enantioanalysis of S-clenbuterol.** *Analytical Letters* 2006;39(7):1311. [Editor's Notes: Presents the title study, using three different electrodes, for analysis of both raw material and serum samples. Contact: Univ Pretoria, Dept Chem, ZA-0002 Pretoria, South Africa.]
  
13. Teng S-F, Wu S-C, Liu C, Li J-H, Chien C-S. **Characteristics and trends of 3,4-methylenedioxymethamphetamine (MDMA) tablets found in Taiwan from 2002 to February 2005.** *Forensic Science International* 2006;161:202. [Editor's Notes: 181 tablets were analyzed by GC/MS. Photographs of the tablet logos are shown. Contact: National Bureau of Controlled Drugs, Department of Health, 6 Linsen South Road, Taipei 100, Taiwan.]
  
14. Wang M, Marriott PJ, Chan WH, Lee AWM, Huie CW. **Enantiomeric separation and quantification of ephedrine-type alkaloids in herbal materials by comprehensive two-dimensional gas chromatography.** *Journal of Chromatography A* 2006;1112(1-2):361. [Editor's Notes: The alkaloids were norephedrine, ephedrine, pseudoephedrine, and methyl-ephedrine. The results differentiated between herbal products from natural vs. synthetic sources. Contact: Hong Kong Baptist Univ, Dept Chem, Kowloon, Hong Kong, Peoples R China.]
  
15. Wolowich WR, Perkins AM, Cienki JJ. **Analysis of the psychoactive terpenoid Salvinorin A content in five *Salvia divinorum* herbal products.** *Pharmacotherapy* 2006;26(9):1268. [Editor's Notes: Analyses were conducted using HPLC and TLC/GC/MS. The samples were purchased from Internet and "Head Shops." The samples were all subpotent with respect to stated Salvinorin A content, and three also contained unreported adulterants. Contact: Nova Southeastern University, 3200 University Drive, Fort Lauderdale, FL 33328.]

#### **Additional References of Possible Interest:**

1. Beckerleg S, Telfer M, Sadiq A. **A rapid assessment of heroin use in Mombasa, Kenya.** *Substance Use & Misuse* 2006;41:1029. [Editor's Notes: Presents the title survey, done in March, 2004. 496 Heroin users were interviewed. Contact: London School of Hygiene & Tropical Medicine, London, UK.]
  
2. Jones AW. **Which articles and which topics in the forensic sciences are most highly cited?** *Science & Justice* 2005;45(4):175. [Editor's Notes: Covers the *Journal of Forensic Sciences* from 1956 to 2005. Contact: Department of Forensic Toxicology, University Hospital, Linköping 581 85, Swed.]
  
3. Neuvonen K, Neuvonen H, Fulop F. **Effect of 4-substitution on psychotomimetic activity of 2,5-dimethoxy amphetamines as studied by means of different substituent parameter scales.** *Bioorganic & Medicinal Chemistry Letters* 2006;16(13):3495. [Editor's Notes: Presents the title study, using various Hammett substituent scales. Contact: Univ Turku, Dept Chem, FIN-20014 Turku, Finland.]
  
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5. Yoon WL. **Near-infrared spectroscopy: A novel tool to detect pharmaceutical counterfeits.** American Pharmaceutical Review 2005;8(5):115. [Editor's Notes: Presents the title study. Contact: New Product Development, GlaxoSmithKline, UK.]

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## THE JOURNAL/TEXTBOOK COLLECTION EXCHANGE

The Journal/Textbook Collection Exchange is a service intended to facilitate the transfer of unwanted journals and textbooks to forensic libraries or other *Microgram* subscribers. At present, this service is offered once a quarter (in January, April, July, and October). The current donations are listed below. The offers are First Come/First Serve (except libraries have preference). There are no charges to the requestor. Provide full mailing address in request. **Important!:** Do not provide an address that irradiates mail!

\* Federal Criminal Code and Rules, 2006 Edition.

\* Physician's Desk Reference, 56th Edition (2002).

**All subscribers are encouraged to donate surplus or unwanted items/collections.** Reference texts and long runs of forensic/analytical journals are of particular interest; however, even single issues are worthwhile. If interested, please consult the *Microgram* website or contact the *Microgram* Editor for further instructions.

The next offering of journals and textbooks will be in the January 2007 issue of *Microgram Bulletin*.

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## THE DEA FY - 2007 STATE AND LOCAL FORENSIC CHEMISTS SEMINAR SCHEDULE

The FY - 2007 schedule for the DEA's State and Local Forensic Chemists Seminar is as follows:

November 13 - 17, 2006  
February 5 - 9, 2007  
May 7 - 11, 2007  
July 9 - 13, 2007  
September 10 - 14, 2007

Note that the school is open only to forensic chemists working for law enforcement agencies, and is intended for chemists who have completed their agency's internal training program and have also been working on the bench for at least one year. There is no tuition charge for this course. The course is held at the AmeriSuites Hotel in Sterling, Virginia (near the Washington/Dulles International Airport). A copy of the application form is reproduced on the last page of the August 2004 issue of *Microgram Bulletin*. Completed applications should be mailed to the Special Testing and Research Laboratory (Attention: J. Kerlavage) at: 22624 Dulles Summit Court, Dulles, VA 20166. For additional information, call 703/668-3337.

\* \* \* \* \*

### The Challenge

Hiring and retaining Computer Forensic professionals is not an easy task. With the ever-expanding use and increasing diversity and sophistication of computers and other digital communication devices, it has become more and more difficult to hire and retain a work force that is capable of handling all of the technological challenges that may arise during the course of an investigation.

Who you recruit for your program depends in part on your organization. Government agencies usually concentrate on criminal and intelligence-gathering cases, while private (business) agencies usually focus on fraud and employee misconduct cases.

However, program emphasis is only the first issue. In law enforcement agencies, should you hire someone with Information Technology (IT) and/or Computer Science (CS) education and experience - or should you instead hire someone who has had many years of law enforcement experience? Individuals with IT/CS training should be able to handle just about any software or technical issue that comes up while processing digital evidence; however, they will have very limited investigative skills. Whereas individuals with law enforcement experience can approach digital evidence cases from an investigator's point of view, but they will (probably) have only limited knowledge of computer systems and digital technologies.

### What is the Right Mix?

The proper answer would appear to be identifying individuals that are fully versed in IT/CS and also have law enforcement and/or investigative background. However, finding such individuals is very difficult - and in today's hiring environment, maybe impossible. This suggests that it would be better to hire IT/CS personnel and train them in investigative techniques, or hire law enforcement professionals and train them in IT and CS. That is, start at either end and train towards the central "ideal" employee, accepting that developing such dual-expertise is a long-term objective. While this approach can succeed, it takes years to develop a complete staff in this manner, and each employee departure or retirement is a major setback.

Experience has shown that in lieu of "ideal" (dual-expertise) employees, a mix of IT/CS and law enforcement professionals is a reasonable compromise. A ratio of 3:1 IT/CS experts to investigators is considered to be about the right combination for a government computer forensic program.

In order to maximize the benefits of such a mixed employee force, you should first create a work environment that promotes information sharing. You can best achieve this by placing everyone in a single, large room with no visual or physical obstructions. This type of setup promotes communication and cooperation.

Second, you should hire individuals that are true experts in their fields, whether in IT/CS or in law enforcement/investigation. Avoid hiring personnel who are "Jacks of all Trades but Masters of None." Third and finally, all employees should be continuously cross-trained in their counterparts' strengths. A well-balanced work force can complement and assist each other, and together should be able to take care of any challenge presented to them.

## **Competing for Qualified Employees**

With the highly competitive market for IT/CS professionals, significantly lower pay scales and hiring freezes by government agencies, and the often long waits applicants have to endure for their security clearances, it is no surprise that law enforcement agencies keep losing quality applicants to the private sector. Government agencies are at a significant disadvantage when competing with computer forensic programs within the private sector, especially those in auditing and finance. However, it is not a one-way street. In many cases, potential employees find a government position to be more attractive on the basis of non-financial aspects, e.g., the better benefits, higher job stability, and enhanced advancement opportunities versus those found in the private sector. The diversity of computer forensic case work is also intriguing to potential employees who are trying to start a career in law enforcement, or who already have a law enforcement background and would like to continue it in a different field.

One of the methods used by DEA and other government agencies to find permanent staff for their computer forensic programs is to use contract personnel as temporary employees, with an eye towards offering government positions to the more qualified contractors. Other methods include offering incentives like signing bonuses or higher grade levels, when such options are available to the agency; these can be very attractive to those professionals that are looking for a competitive salary and/or benefits versus those offered by the private sector.

## **Conclusions**

Having an aggressive hiring program, that emphasizes the benefits of government service, is key to attracting qualified IT/CS professionals and seasoned investigators to law enforcement computer forensics programs. In summary, strive to develop good hiring criteria and always try to hire individuals with the qualifications that best fit your program.

## **Previous Computer Corner Columns in this Field**

The following columns may be of interest for managers trying to staff their computer forensic programs:

#136 - July 2000 - Basic Examiner Qualifications \*

#148 - July 2001 - Different Computer Forensic Techniques in Drug Investigations \*

#155 - February 2003 - The Impact of Specializations

#174 - September 2003 - Examiner Candidate Interview Strategies

#179 - February 2004 - Digital Evidence Trends

#200 - November 2005 - New Examiner Interview Topics

[\* - Law Enforcement Restricted Issue of *Microgram*]

Questions or comments? E-mail: [Walter.Aponte -at- usdoj.gov](mailto:Walter.Aponte-usdoj.gov)

# Microgram

## *Bulletin*

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Washington, DC 20537

The U.S. Attorney General has determined that the publication of this periodical is necessary in the transaction of the public business required by the Department of Justice. Information, instructions, and disclaimers are published in the January issues.

**- NOVEMBER 2006 -**

**- INTELLIGENCE ALERT -**

### **“PURPLE” (COUGH SYRUP CONTAINING CODEINE AND OXYCODONE) IN WILKINSBURG, PENNSYLVANIA**

The Allegheny County Medical Examiner's Office, Division of Laboratories (Pittsburgh, Pennsylvania) recently received a clear glass vial containing a viscous, nearly opaque purple liquid with a strong grape odor, alleged “Purple” (cough syrup supposedly containing cocaine and hydrocodone) (see Photo 1). The exhibit was acquired in Wilkesburg (a suburb of Pittsburgh) by the Wilkesburg Police (details sensitive). Analysis of an extract of the liquid (total net volume and mass 10 milliliters and 12.2 grams) by GC/MS and GC/FID, however, indicated neither cocaine or hydrocodone but rather a mixture of doxylamine, promethazine, dextromethorphan (all non-controlled), codeine, and oxycodone. The codeine and oxycodone were not quantitated, but based on the chromatograms were at a rather low loading. This was the first submission of “Purple” to the laboratory.



**Photo 1**

**- INTELLIGENCE ALERT -**

**BROWN HEROIN IN NORTH CHICAGO, ILLINOIS**

The Northeastern Illinois Regional Crime Laboratory (Vernon Hills) recently received a large lump of a dark-brown substance with a strong acetic acid odor, that field-tested positive for heroin (see Photo 2). The exhibit was seized by the Waukegan Police at a residence in North Chicago, along with large amounts of cocaine and cannabis (details sensitive). Analysis of the substance (total net mass approximately 360 grams) by GC/MS confirmed heroin, and also identified 6-monoacetyl-morphine (6-MAM), morphine, and noscapine (not quantitated, but a fairly high loading of heroin and 6-MAM based on the TIC). This was the largest amount of heroin ever submitted to the laboratory.



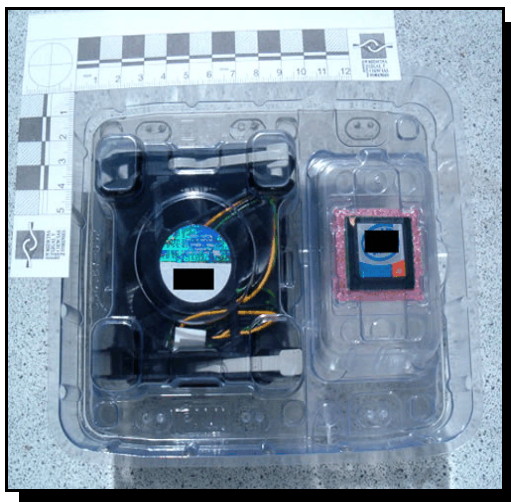
**Photo 2**

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**- INTELLIGENCE ALERT -**

**COMPUTER PROCESSORS CONTAINING HEROIN IN BOGOTA, COLOMBIA**

The National Institute of Legal Medicine and Forensic Sciences Laboratory (Bogotá, Colombia) recently received 8 commercially packaged, advanced computer processors, each containing a compressed brown powder inside its heat dissipater, suspected heroin (see Photos 3 and 4). The exhibits were en route from Colombia to Miami, Florida and were seized by Colombian National Police at the El Dorado Airport in Bogotá. Of note, the processors were fully operational and the packaging (including the boxes, not shown) appeared to be completely legitimate. Analysis of the powder (total net mass 214.4 grams) by UV, GC/FID, and GC/MS confirmed 70 percent heroin. This was the laboratory's first encounter with this smuggling technique.



**Photo 3**



**Photo 4**



**- INTELLIGENCE ALERT -**

**PSILOCYBIN MUSHROOM CHOCOLATES NEAR ROCHESTER, NEW YORK**

The Monroe County Public Safety Laboratory (Rochester, New York) recently received a polydrug seizure including: A) Seven "Omega" logo tablets found to contain a mixture of methamphetamine, MDMA, caffeine, and procaine (not quantitated); B) Three generic 10 milligram oxycodone tablets; C) Seven bags of marijuana (total net mass 16 grams); and D) Eight home-made chocolate concoctions containing plant material, suspected to be psilocybin mushroom parts. The exhibits were seized by local law enforcement authorities at an outdoor rock concert located in a theme park west of Rochester (details sensitive). Each of the chocolates weighed approximately 30 grams, was approximately 4.5 centimeters in diameter by 2.5 centimeters thick, was wrapped in silver foil, and had a "SOLO" logo (similar to that found on commercial disposable cups) (see Photos 5 and 6).

The plant material was manually separated from the chocolate by crushing and carefully removing the visual pieces with tweezers. Each of the chocolates contained approximately 120 milligrams of plant material. The remaining crushed chocolate, which at this point did not contain any visible residue (as determined under stereoscopic 10x magnification), was not tested further.

The plant material was triturated with sodium bicarbonate and minimal water, then extracted twice with chloroform. The chloroform extracts were then dried down to a residue. Analysis of the residue by GC/MSD and TLC indicated psilocybin, psilocin, theobromine, and caffeine, confirming *Psilocybe* mushrooms. The psilocybin and psilocin were not quantitated, but were present at a moderate loading as compared with other mushroom submissions. Theobromine and caffeine are natural products in chocolate. This is the first submission of psilocybin mushroom chocolates to the laboratory.



**Photo 5**



**Photo 6**

**- INTELLIGENCE ALERT -**

**BLOTTER ACID MIMICS (CONTAINING 4-BROMO-2,5-DIMETHOXY-AMPHETAMINE (DOB)) IN CONCORD, CALIFORNIA**

The Contra Costa County Sheriff - Coroner's Office Forensic Services Division Laboratory (Martinez, California) recently received a small sheet of perforated paper divided into nine and a half squares, each 5 x 5 millimeters and imprinted with an ornate wheel-burst pattern surrounding a heart, suspected LSD "blotter acid" (see Photo 7). The exhibit was seized in Concord, California by the Concord Police (details unavailable; Concord is about 30 miles east of San Francisco). Preliminary screening by long-wavelength UV and *para*-dimethylamino-benzaldehyde (PD MBA), however, were both negative for LSD. Analysis of a methanolic extract by GC/MS instead identified 4-bromo-2,5-dimethoxyamphetamine (DOB), not formally quantitated but a moderate loading based on the TIC. This is the first submission of DOB, and is also believed to be the first submission of an LSD blotter acid mimic and the first submission of this unusual logo, to the laboratory.



**Photo 7**

\* \* \* \* \*

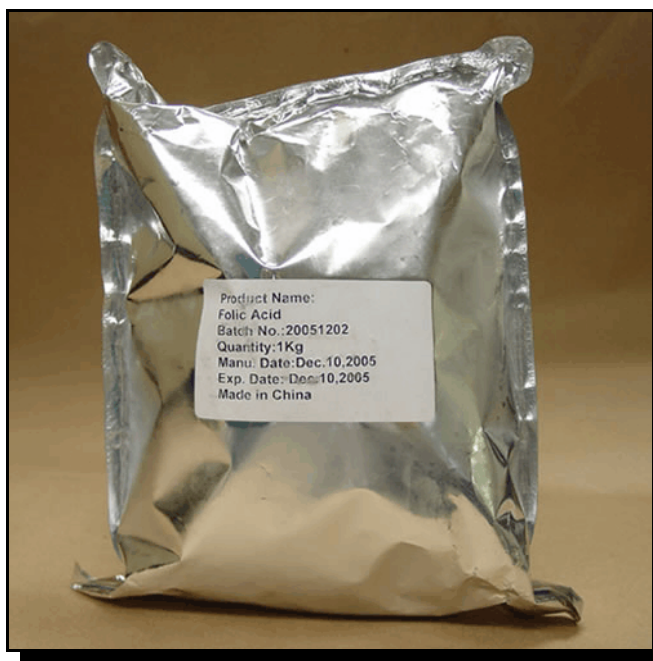
**- INTELLIGENCE ALERT -**

**LARGE SEIZURE OF TESTOSTERONE PROPIONATE AND TESTOSTERONE ENANTHATE IN EAU CLAIRE, WISCONSIN**

The Wisconsin State Crime Laboratory in Wausau recently received a multi-exhibit submission of suspected steroids, including:

- A) Two crimp-sealed metal containers labeled "Testosterone Enanthate," both containing 995.4 grams of chunky white powder;
- B) A silver-colored bag labeled "Folic Acid," containing 999.7 grams of white chunky powder material (see Photo 8, next page);
- C) A silver-colored bag labeled "Folic Acid," containing 553.0 grams of yellow chunky material;
- D) An unlabelled glass jar containing 138.4 grams of white chunky powder material;
- E) A silver-colored bag labeled "Vitamin B6," containing 1001.3 grams of white powder;
- F) A silver-colored bag labeled "Vatamin B6" [sic], containing 843.6 grams of white powder;
- G) An unlabelled glass jar containing 92.5 grams of white powder; and
- H) Four unlabelled bottles and seven unlabelled syringes, containing a total of 111.9 grams of brownish liquid.

The exhibits were seized from a residence located in Eau Claire, pursuant to an extended investigation by the Wisconsin Division of Criminal Investigation - Narcotics Bureau (details sensitive). Items A, B, C, E, and F appeared to be commercially packaged. Analyses by color tests, GC/FID, and GC/MS identified testosterone enanthate in Items A, B, C, and D (total net mass 3,681.9 grams); testosterone propionate in Items E, F, and G (total net mass 1,937.4 grams); and a mixture of testosterone propionate and testosterone enanthate in Item H (quantitations not performed). Only Item A was consistent with its labelling (that is, testosterone enanthate). This is the first submission of this type to the laboratory, and is believed to be the largest steroid submission ever to the Wisconsin State Crime Laboratory system.



**Photo 8**

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#### **- INTELLIGENCE ALERT -**

#### **4-CHLORO-2,5-DIMETHOXYAMPHETAMINE (DOC) AND 4-iodo-2,5-DIMETHOXYAMPHETAMINE (DOI) IN BERKLEY, MICHIGAN**

The DEA North Central Laboratory (Chicago, Illinois) recently received a polydrug submission consisting of: A) 40.6 milliliters (40.4 grams) of a clear, colorless liquid (pH 9), marked as “D.O.I.”, presumed to be a solution of 4-iodo-2,5-dimethoxyamphetamine (DOI); B) Two resealable plastic bags containing in total 70.6 grams of fine, white powder, one marked as “I” and the other as “DOB”, the latter presumed to be 4-bromo-2,5-dimethoxyamphetamine (DOB); and C) Three resealable plastic bags containing in total of 14.5 grams of white powder mixed with small, off-white crystals/solid chunks, one marked as “DOC”, two marked with weights only, all presumed 4-chloro-2,5-dimethoxyamphetamine (DOC) (no photos). The exhibits were seized at a residence in Berkley, Michigan by agents from the DEA Detroit Division Office (no further details); Berkley is a suburb of Detroit. Analysis of the liquid by Watesmo paper, color testing, FTIR, GC/MS, and NMR indicated not DOI but rather an aqueous solution of DOC (suspected base, not quantitated). Analysis of the fine white powder (same instrumental techniques) indicated not DOB but rather DOI in both bags (suspected to be the hydrochloride salt; not quantitated but apparently high purity). Analysis of the off-white crystals/solid chunks (same instrumental techniques) confirmed DOC in all three bags (suspected to be the hydrochloride salt; not quantitated but apparently high purity); a possible DOC synthesis by-product was also noted. These are the first known submissions of DOC and DOI to the North Central Laboratory.



**- INTELLIGENCE ALERT -**

**BLACK TAR HEROIN CONCEALED INSIDE A DISASSEMBLED  
ROCKING CHAIR IN WASHINGTON, DC**

The DEA Mid-Atlantic Laboratory (Largo, Maryland) recently received a disassembled rocking chair containing 10 separate plastic-wrapped packages of a black, tar-like substance concealed within hollowed-out sections, suspected black-tar heroin (see Photos 9 - 10). The exhibit originated in El Salvador, and was seized in Washington, DC by Immigration and Customs Enforcement personnel (no further details). Analysis of the substance (total net mass 389.9 grams) by GC, GC/MS, and IR confirmed 34 percent heroin hydrochloride, along with lidocaine and other expected alkaloids and typical heroin reaction by-products. Black-tar heroin exhibits are not commonly submitted to the Mid-Atlantic Laboratory. This is first submission of this smuggling technique to the Laboratory.



**Photo 9**



**Photo 10**

\* \* \* \* \*

**- INTELLIGENCE BRIEF -**

**INDUSTRIAL-SCALE METHAMPHETAMINE/MDMA  
LABORATORY IN CIKANDE, INDONESIA**

In late 2005, Indonesian authorities raided a very large clandestine laboratory located in Cikande, Indonesia (located approximately 60 kilometers west of Jakarta). The operation was producing large-scale quantities of both methamphetamine and MDMA. Subsequently, two chemists from the DEA Special Testing and Research Laboratory (Dulles, Virginia) visited the site to document the laboratory setup and collect samples.

The site consisted of a large warehouse divided into multiple rooms with a variety of chemicals located throughout (see Photo 11, next page). The methamphetamine and MDMA production facilities were both located in the back of the warehouse, hidden behind a wall and accessed via a secret door.



**Photo 11**

Methamphetamine was being synthesized in two large reactors using ephedrine, red phosphorus, and iodine (see one of the reactors in Photo 12). Each batch started with 100 kilograms of *l*-ephedrine hydrochloride. After the reaction was complete, the methamphetamine base was isolated, converted to the hydrochloride, and recrystallized from a minimal amount of water, to yield approximately 75 kilograms of "Ice"-style *d*-methamphetamine hydrochloride. MDMA was also being synthesized in two large reactors (see Photo 13), using 3,4-methylenedioxyphenyl-2-propanone (MDP2P), methylamine, aluminum foil, and mercuric chloride, in methanol. Each batch started with 20 liters of MDP2P. After the reaction was complete, the MDMA base was isolated and distilled, converted to the hydrochloride, and crystallized in freezers to yield approximately 8 kilograms of MDMA hydrochloride. Additional materials and equipment indicated the large-scale production of MDMA (Ecstasy) tablets. The equipment included a 21-stage rotary tablet press capable of producing from 100,000 to 250,000 tablets in 8 hours. Also present were new and used commercial mixers and drying ovens. Tableting materials included cellulose, starch, dyes, and caffeine.



**Photo 12**



**Photo 13**

## SELECTED REFERENCES

[Selected references are a compilation of recent publications of presumed interest to forensic chemists. Unless otherwise stated, all listed citations are published in English. Abbreviated mailing address information duplicates that provided by the abstracting service. Patents and Proceedings are reported only by their *Chemical Abstracts* citation number.]

1. Agg KM, Craddock AF, Bos R, Francis PS, Lewis SW, Barnett NW. **A rapid test for heroin (3,6-diacetylmorphine) based on two chemiluminescence reactions.** *Journal of Forensic Sciences* 2006;51(5):1080. [Editor's Notes: Used a tris(2,2'-bipyridyl)ruthenium(III) reagent (sensitive for heroin) and potassium permanganate in aqueous acidic polyphosphate (sensitive for morphine and MAM). The tests were verified on 14 forensic samples. Contact: School of Life and Environmental Sciences, Deakin University, Geelong, Vic 3217, Australia.]
2. Apollonio LG, Whittall IR, Pianca DJ, Kyd JM, Maher WA. **Product ion mass spectra of amphetamine-type substances, designer analogues, and ketamine using ultra-performance liquid chromatography/tandem mass spectrometry.** *Rapid Communications in Mass Spectrometry* 2006;20(15):2259. [Editor's Notes: Compounds included amphetamine, methamphetamine, MDA, MDMA, PMA, 4-MTA, MBDB, and ketamine; analyses were completed in less than 4 minutes. Contact: National Centre for Forensic Studies, University of Canberra, Bruce ACT 2601, Australia.]
3. Caligiani A, Palla G, Bernardelli B. **GC-MS analysis of hashish samples: A case of adulteration with colophony.** *Journal of Forensic Sciences* 2006;51(5):1096. [Editor's Notes: Presents the title study on a sample seized in Italy (colophony is the acidic flux used for soldering). Contact: Dipartimento di Chimica Organica e Industriale, Universita degli Studi di Parma, Parco Area delle Scienze 17A, 43100-Parma, Italy.]
4. Chen L, Luo G, Wang J, Liu K, Wang Y. **Recent advances in abused drug analysis.** *Yaowu Fenxi Zazhi* 2005;25(7):881. [Editor's Notes: A review. This article is written in Chinese. Contact: Department of Chemistry, Tsinghua University, Beijing, Peop. Rep. China 100084.]
5. Cheng JYK, Chan MF, Chan TW, Hung MY. **Impurity profiling of ecstasy tablets seized in Hong Kong by gas chromatography-mass spectrometry.** *Forensic Science International* 2006;162(1-3):87. [Editor's Notes: A study on the impurity profiles of ecstasy tablets from 89 seizures in Hong Kong from 2002 to early 2004. A total of 19 identified impurities were selected as markers for impurity profiling, and the data matrices were classified by hierarchical cluster analysis (HCA). Contact: Forensic Science Division, Ho Man Tin Government Offices, Hong Kong Government Laboratory, 88 Chung Hau Street, Hong Kong, SAR, Peop. Rep. China.]
6. Gosav S, Praisler M, Van Bocxlaer J, De Leenheer AP, Massart DL. **Class identity assignment for amphetamines using neural networks and GC-FTIR data.** *Spectrochimica Acta, Part A: Molecular and Biomolecular Spectroscopy* 2006;64(5):1110. [Editor's Notes: Presents a feasibility study of the title technique, including a variety of stimulant amphetamines, hallucinogenic amphetamines, and non-amphetamines (not specified in the Abstract). Contact: Department of Physics, Faculty of Sciences, University of Galati, Domneasca St. 43, Galati 6200, Rom.]
7. Keller T, Keller A, Tutsch-Bauer E, Monticelli F. **Application of ion mobility spectrometry in cases of forensic interest.** *Forensic Science International* 2006;161(2-3):130. [Editor's Notes:



A minor review; also reports the use of IMS for the rapid analysis of hallucinogenic mushrooms. Contact: Institute of Forensic Medicine, University of Salzburg, Ignaz-Harrer-Street 79, Salzburg 5020, Austria.]

8. Kim SC, Chung H, Lee SK, Park YH, Yoo YC, Yun Y-P. **Simultaneous analysis of d-3-methoxy-17-methylmorphinan and l-3-methoxy-17-methylmorphinan by high pressure liquid chromatography equipped with PDA.** Forensic Science International 2006;161(2-3):185. [Editor's Notes: The title compounds are better known as dextromethorphan and levomethorphan. The technique used a chiral column. 32 confiscated samples were analyzed. Contact: National Institute of Scientific Investigation, Chungbuk National University, 331-1 SinWol 7-dong, Yang-Chun Gu, Seoul 158-707, S. Korea.]
9. Kuila DK, Muhkopadhyay B, Lahiri SC. **Identification and estimation of methaqualone in toffee samples using gas chromatography - mass spectrometry, Fourier transform infrared spectrometry, and high-performance thin-layer chromatography.** Forensic Science Communications 2006;8(4):(No Page Numbers). [Editor's Notes: Presents the analysis of some Indian-brand toffee samples suspected to contain adulterants/hypnotic drugs and alcohol. Note that FSC is an on-line journal. Contact: Central Forensic Science Laboratory, Kolkata, India.]
10. Li T-L, Giang Y-S, Hsu J-F, Cheng S-G, Liu RH, Wang S-M. **Artifacts in the GC- MS profiling of underivatized methamphetamine hydrochloride.** Forensic Science International 2006;162(1-3):113. [Editor's Notes: GC/MS analysis of methamphetamine hydrochloride in methanol with old inlet liners at temperatures above 200 °C gave appreciable amounts of N,N-dimethylamphetamine and amphetamine. Contact: Department of Forensic Sciences, Taoyuan, Central Police University, Chinese Taipei, Taichung.]
11. Pavlic M, Libiseller K, Oberacher H. **Combined use of ESI-QqTOF-MS and ESI-QqTOF-MS/MS with mass-spectral library search for qualitative analysis of drugs.** Analytical and Bioanalytical Chemistry 2006;386(1):69. [Editor's Notes: 319 drugs (therapeutic and illicit) were analyzed. The resulting spectral library was successfully applied to the characterization of 39 forensic casework samples. Contact: Institute of Legal Medicine, Innsbruck Medical University, Muellerstrasse 44, Innsbruck 6020, Austria.]
12. Ricci C, Chan KLA, Kazarian SG. **Combining the tape- lift method and Fourier transform infrared spectroscopic imaging for forensic applications.** Applied Spectroscopy 2006;60(9):1013. [Editor's Notes: The sensitivity limits of FT-IR imaging using 3 different ATR crystals (Ge, ZnSe, and diamond) in 3 different optical arrangements for the detection of model systems of ibuprofen and paracetamol are presented. The technique was applied to detection of traces of heroin. Contact: Department of Chemical Engineering, Imperial College London, London SW7 2AZ, UK.]
13. Staples, Edward J.; Viswanathan, Shekar. **Detection of contraband and drugs of abuse using an ultrafast SAW/GC vapor analyzer.** AIChE Annual Meeting, Conference Proceedings, Cincinnati, OH, United States, Oct. 30-Nov. 4, 2005. [Editor's Notes: Presents the title technique. Contact: Electronic Sensor Technology, Newbury Park, CA 91320.]
14. Toonen M, Ribot S, Thissen J. **Yield of illicit indoor cannabis cultivation in the Netherlands.** Journal of Forensic Sciences 2006;51(5):1050. [Editor's Notes: Presents a formula for determining a total expected yield of mature female flower buds (sinsimella) from indoor grow operations, regardless of maturity at the time of seizure. Contact: Plant Research International, Wageningen-UR, PO Box 16, 6700 AA Wageningen, The Netherlands.]

15. Wood M, Laloup M, Samyn N, del Mar Ramirez Fernandez M, de Bruijn EA, Maes RAA, De Boeck G. **Recent applications of liquid chromatography-mass spectrometry in forensic science.** Journal of Chromatography A 2006;1130(1):3. [Editor's Notes: A survey of applications reported from 2002 to 2005; focuses on trace analysis, including drugs (not specified in the Abstract). Contact: Waters Corporation, Micromass UK Ltd, Atlas Park, Simonsway, MS Technologies Centre, Wythenshawe, Manchester M22 5PP.]

#### **Additional References of Possible Interest:**

1. Balogh MP. **DESI, IMS, and resurgent challenges to HPLC-MS.** LCGC North America 2006;24(1):46. [Editor's Notes: An overview. Contact: LC-MS Technology Development, Waters Corp., Milford, MA (zip code not provided).]
2. Rasmussen A, Deckert V. **SERS surface enhanced Raman scattering.** G.I.T. Laboratory Journal, Europe 2006;10(1):12. [Editor's Notes: A review. Contact: ISAS - Institute for Analysis Sciences, Dortmund, Germany.]
3. Van Thuyne W, Van Eenoo P, Delbeke FT. **Nutritional supplements: Prevalence of use and contamination with doping agents.** Nutrition Research Reviews 2006;19(1):147. [Editor's Notes: A review. Contact: Doping Control Laboratory, Department of Clinical Biology, Microbiology and Immunology, Faculty of Medicine and Health Sciences, Ghent University - UGent, Zwijnaarde B-9052, Belg.]

\* \* \* \* \*

## ***Microgram* Editor Email Address Change Coming!**

Effective January 1st, 2007, the *Microgram* Editor's email address will change from [microgram\\_editor-at-mailsnare.net](mailto:microgram_editor-at-mailsnare.net) to: [microgram-2007-at-mailsnare.net](mailto:microgram-2007-at-mailsnare.net) This change has been necessitated by the ever-increasing numbers of spam emails being received at the [microgram\\_editor-at-mailsnare.net](mailto:microgram_editor-at-mailsnare.net) address. An automated response will be maintained on the [microgram\\_editor-at-mailsnare.net](mailto:microgram_editor-at-mailsnare.net) address for the first three months of CY 2007.

Please make a note of this change. Note that similar email address changes can be anticipated on the first of each year, substituting the appropriate year in the address.

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\* \* \* \* \*

Until recently, few people in the general public had more than a cursory understanding of *Computer Forensics*. And therefore (and not surprisingly), there was no defined career track to a computer forensics position. Most examiners in law enforcement organizations obtained their positions by being the right person in the right place at the right time. Usually they were the only person in the office who had some kind of formal computer science education or training, or who “dabbled” in computer hardware and software more or less as a hobby - and so were called upon when seized computers began to be submitted as potential evidence.

From a personal standpoint, I knew about computers, but until late 1997 I had never heard of computer forensics. It was a job announcement for a position in the U.S. Drug Enforcement Administration’s Computer Forensics Program that first caught my attention. Once I was hired, most of my knowledge was acquired by observing computer forensics examiners who were already working on casework, and then by on-the-job training. At that time, the forensic tool of choice was Safeback®, and a typical hard drive was only megabytes in size. To put this in perspective, consider that there are now dozens of forensic tools, and it’s hard to find a hard drive that is smaller than 80 gigabytes (in fact, an examiner could encounter a 750 gigabyte hard drive).

My entry experiences were typical. In the mid-1990’s, computer forensics was infrequently spoken of within the Computer Science (CS), Information Technology (IT), or law enforcement communities. If you had done an Internet search on the phrase “Computer Forensics” in 1995, you probably would have gotten only a few hits (if any!) Today, you will get over two million hits. Computer forensics is everywhere now, and law enforcement, judicial, commercial, and private sector organizations are all looking for experienced examiners.

While preparing this column, I went on-line to see if there were educational institutions that offered courses or degrees in Computer Forensics. Frankly, I wasn’t expecting much – but to my surprise, I found quite a few. Here are some of them\* (but there are many more that are not listed here):

- *The University of New Haven* (Connecticut) – offers a graduate certificate in computer forensics, and was the first institution to offer it.
- *The University of Central Florida* (Florida) – offers a graduate certificate in computer forensics, and was the second institution to offer it.
- *The George Washington University* (Washington, DC) – offers a Master of Arts in Criminal Justice, with an emphasis in high-tech crime.
- *Marshall University* (West Virginia) – offers a graduate certificate program, with an emphasis in computer forensics.

A search on the term “Computer Forensics Certification” gives, for example\*:

- Certified Information System Security Professional (CISSP)
- Certified Forensic Computer Examiner (CFCE)
- Certified Computer Examiner (CCE)
- A+
- Net+ - Network Certification
- MCSE - Microsoft Certified System Engineer

Similarly, a search on the term “Computer Forensics Training” gives, for example\*:

- New Technologies, Inc. (NTI) Automated Forensic Software
- AccessData – Forensic Tool Kit (FTK)
- Guidance Software – Encase
- Mares & Company – Advance Computer Forensic Training Seminars
- Paraben
- ASRDATA
- IRS (Law Enforcement Only) – ILook/ILook Imager

Finally, a few websites that provide information on training opportunities in Computer Forensics include, for example\*:

- [www.compuforensics.com/training.htm](http://www.compuforensics.com/training.htm)
- [www.infosecinstitute.com](http://www.infosecinstitute.com)
- [www.digitalintelligence.com](http://www.digitalintelligence.com)
- [www.dmares.com/maresware/training](http://www.dmares.com/maresware/training)
- [www.encase.com](http://www.encase.com)
- [www.cybersecurityinstitute.biz/training](http://www.cybersecurityinstitute.biz/training)
- [www.nw3c.org](http://www.nw3c.org)
- [www.dfrws.org](http://www.dfrws.org)

In conclusion, it is much easier for someone to get into the field of Computer Forensics today versus even just five years ago. The opportunities are almost limitless. It takes time to explore all the options, but time well spent.

Questions or comments? E-mail: [Steven.L.Carter -at- usdoj.gov](mailto:Steven.L.Carter-usdoj.gov)

\* \* \* \* \*

[ \* Note: Listing in this Column does not imply endorsement by the U.S. Government.]

# Microgram

## *Bulletin*

**Published by:**

The Drug Enforcement Administration  
Office of Forensic Sciences  
Washington, DC 20537

The U.S. Attorney General has determined that the publication of this periodical is necessary in the transaction of the public business required by the Department of Justice. Information, instructions, and disclaimers are published in the January issues.

- DECEMBER 2006 -

- INTELLIGENCE ALERT -

### LSD BLOTTER ACID MIMICS (CONTAINING 4-BROMO-2,5-DIMETHOXY-AMPHETAMINE (DOB)) IN AMES, IOWA

The Iowa Criminalistics Laboratory (Ankeny, Iowa) recently received two full and two half pieces of blotter paper, 6 millimeters square, with unusual designs on both sides, suspected LSD “blotter acid” (see Photo 1 for the “blue side” and Photo 2 for the “green side”). “Blotter acid” with patterns on both sides is uncommon. The exhibits were seized in Ames

by the Ames Police (circumstances unknown; Ames is located in central Iowa). Analysis of extracts by PDMAB (negative), Marquis (green), TLC, and GC/MS, however, indicated not LSD but rather 4-bromo-2,5-dimethoxyamphetamine (DOB) (not quantitated, but a moderate loading based on the GC/MS). This was the laboratory’s first encounter with DOB in any form.

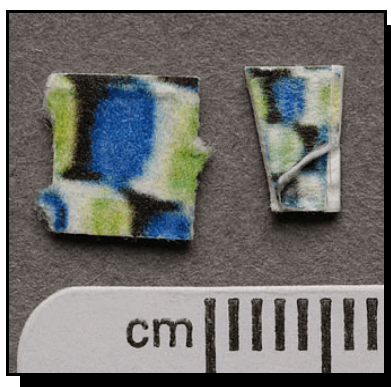


Photo 1



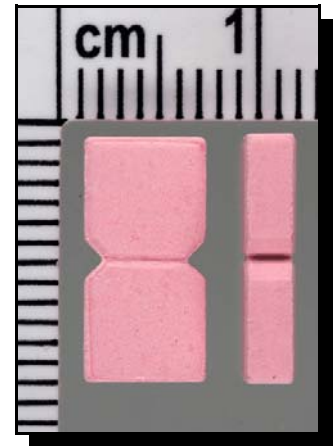
Photo 2

**- INTELLIGENCE ALERT -**

**COUNTERFEIT LETROZOLE AND UNUSUAL TESTOSTERONE  
IN ROCHESTER, NEW YORK**

The Monroe County Public Safety Laboratory (Rochester, New York) recently received a polydrug submission including: A) An unlabeled baggie containing 17 pink tablets, submitted as suspected "Fumara" [sic] (see Photo 3); B) two factory-sealed 10 milliliter bottles labeled "Testosterone Propionate 125 mg/ml" (see Photo 4); and C) a baggie with 2 grams of marijuana. The exhibits were seized in Rochester by a local law enforcement agency (details not available).

Each of the pink tablets weighed 250 milligrams, was flat and rectangular, measured 12 x 6 x 2 millimeters, and was scored and indented in the middle. Analysis of a basic extract by GC/MS identified Letrozole, a nonsteroidal aromatase inhibitor sold as Femara. Pharmaceutical Femara is sole-source marketed as a round, dark yellow, film coated, slightly biconvex tablet imprinted with [FV] on one side and [CG] on the reverse, containing 2.5 milligrams of Letrozole. It is prescribed for the treatment of breast cancer in women, and acts by inhibiting the conversion of androgens to estrogens. Males abusing anabolic steroids are known to take aromatase inhibitors to inhibit gynecomastia (male breast development). This is the first submission of Letrozole to the laboratory, and is also (according to the manufacturer) the first Femara counterfeit to be identified anywhere.

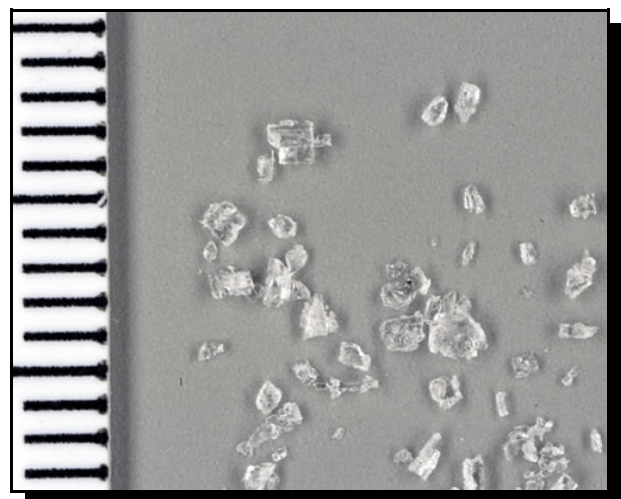


**Photo 3**

The Testosterone Propionate vials were also interesting. Upon removal of the crimp seal and stopper, some of the liquid immediately crystallized and settled to the bottom of the vial. Unusually, crystals also began forming in the unopened vial within two days. Analysis of the crystals from the opened vial by FTIR (see Photo 5) confirmed testosterone propionate. The listed company (blacked out on the photo) appears to be a foreign manufacturer. A tabulation of the 93 testosterone propionate products listed in Anabolics 2006 suggests that 125 milligrams/



**Photo 4**



**Photo 5**



milliliter is an unusually high concentration of this steroid, and probably explains the observed spontaneous crystallization. The solutions were not formally quantitated. The laboratory has previously received various anabolic steroids.

[Editor's Note: For comprehensive analytical data for Letrozole, see: Geer LC, Hays PA. Letrozole (Femara). Microgram Journal 2003;1(3-4):190.]

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**- INTELLIGENCE ALERT -**

**ECSTASY COMBINATION TABLETS (CONTAINING MDMA AND  
3-CHLOROPHENYLPYPERAZINE (mCPP)) IN THESSALONIKI, GREECE**

The Seized Materials Laboratory of the General State Chemical Laboratory's 2nd Chemical Division of Thessaloniki, Greece recently received two submissions of white tablets with a "Shark" logo, both suspected MDMA (see Photo 6). The first (156 tablets) was from the Drugs Combat Subdivision of West Thessaloniki, while the second (11,151 tablets) was from the Police Department of Edessa (76 kilometers northwest of Thessaloniki); details on the seizures were unavailable. The tablets were 9 millimeters in diameter by



**Photo 6**

3 millimeters thick, and had an average mass of 299.6 milligrams. Analysis by color test (Marquis), GC/FID, and GC/MS indicated a mixture of 6.5 percent MDMA and 5.9 percent 3-chlorophenylpiperazine (mCPP; not confirmed due to the lack of a standard). This was the first submission of Ecstasy combination tablets of this composition to the laboratory; subsequently, however, the Seized Materials Laboratory of the 3rd Chemical Division of Athens reported the receipt of 100,760 of the same type tablets from two seizures made in Athens.

[Editor's Notes: These tablets are similar in appearance to those recently seized in Vernon Hills, Illinois (Microgram Bulletin 2006;39(10):123); however, the latter tablets contained mCPP but only trace MDMA.]

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**- INTELLIGENCE ALERT -**

**CHOCOLATE CANDY BAR MIMICS (CONTAINING OPIUM) FROM IRAN**

The DEA Southwest Laboratory (Vista, California) recently received three exhibits containing a total of 148 chocolate bars, suspected to contain opium. The exhibits were seized by Immigration and Custom Enforcement agents from within suitcases on a flight arriving at the



**Photo 7**



**Photo 8**

Los Angeles International Airport from Iran. The bars had wrappings that were similar to those of two popular candy bars (see Photos 7 - 8). Each bar had a core of a very dark brown substance, that was wrapped in layers of clear plastic and carbon paper, which was then coated with chocolate (see Photo 9; the blue paper is the carbon paper). Analysis of the dark brown substance (total net mass 7.851 kilograms) by desorption electrospray ionization - mass spectrometry (DESI-MS) and GC/MS identified morphine, codeine, thebaine, papaverine, and noscapine, confirming opium (quantitations not performed). The Southwest Laboratory has previously encountered raw opium that had been formed and wrapped to look like pieces of chocolate (see: Microgram Bulletin 2005;38(6):95); however, this was the first submission of opium that had been coated with chocolate.



**Photo 9**

\* \* \* \* \*

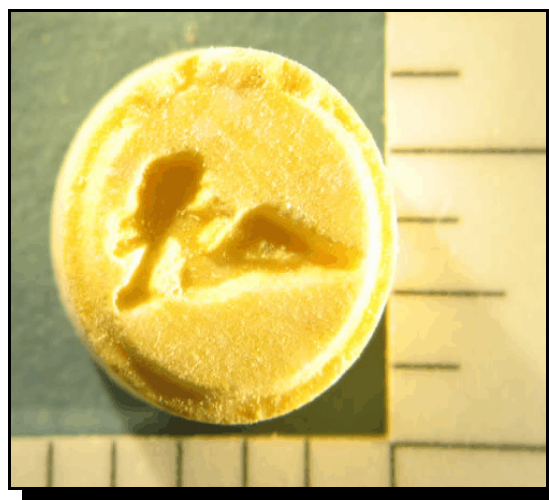
### **- INTELLIGENCE ALERT -**

#### **ECSTASY COMBINATION TABLETS (CONTAINING MDMA, METHAMPHETAMINE AND MDDMA) IN MIAMI, FLORIDA**

The DEA Southeast Laboratory (Miami, Florida) recently received two submissions totaling over 16,000 yellow tablets with two logo types, all suspected MDMA. Both submissions were seized in a combined operation by DEA Agents and the Miami Police, the first from an apartment in Miami, and the second from outside the Bayfront Mall in Miami. The first submission contained: A) 4,993 tablets with a superimposed "LV" logo, similar to the Louis Vuitton designer label (see Photo 10, next page); and B) 4,720 tablets with a reclining woman logo (see Photo 11, next page). The second submission contained C) 6,436 tablets also with the "LV" logo (same as in Photo 10). The tablets were all about 8 millimeters in diameter by 8 millimeters thick, and weighed approximately 280 milligrams each. Analyses by GC/FID,



**Photo 10**



**Photo 11**

GC/MS, FTIR/ATR, Raman, and NMR confirmed a nearly identical mixture in all three sets of tablets: MDMA (30 milligrams/tablet), methamphetamine (7 milligrams/tablet), 3,4-methylenedioxymethylamphetamine (MDDMA, trace), caffeine, and procaine (salt forms not determined). There has been a recent increase in this type of submission to the Southeast Laboratory, and both logo types have been previously (but only sporadically) encountered.

\* \* \* \* \*

### **- INTELLIGENCE ALERT -**

### **HEROIN BRICKS IN LAREDO, TEXAS**

The DEA South Central Laboratory (Dallas, Texas) recently received 13 bricks of compressed, light brown powder with an embossed “CAPRICORNIO” over a Ram’s Head logo, suspected heroin (see Photo 12). The exhibits were seized by Customs and Border Protection Officers pursuant to a vehicle stop at the Laredo Point of Entry. Unusually, the bricks were compressed, sized, and wrapped (in tape) similarly to kilogram bricks of cocaine hydrochloride. Analysis of the compressed powder (total net mass 13 kilograms) by GC/MS, FTIR, and HPLC confirmed 84 percent heroin hydrochloride. This was the first submission of heroin compressed, sized, and packaged like cocaine kilogram bricks, and also the first submission of this logo type, to the South Central Laboratory.



**Photo 12**



**- INTELLIGENCE ALERT -**

**PONCHO BUTTONS CONTAINING HEROIN IN NEW YORK**

The DEA Northeast Laboratory (New York, New York) recently received three cloth ponchos with large, hollow buttons containing an off-white powder, suspected heroin (see Photos 13 and 14, both displayed oversize to show detail). The ponchos were seized in New York by agents from the DEA New York Field Division (circumstances sensitive). The ponchos contained a total of 78 buttons suspected of containing heroin. Analysis of the powder (total net mass 255.7 grams in 78 buttons) by color testing, GC/FID, GC/MS, and FTIR/ATR confirmed 67 percent heroin hydrochloride, and lidocaine. The Northeast Laboratory has encountered a very wide variety of concealment techniques, but this is the first ever exhibits where heroin was smuggled inside buttons.



**Photo 13 - Scale is in Inches**

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**Photo 14**

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## SELECTED REFERENCES

[Selected references are a compilation of recent publications of presumed interest to forensic chemists. Unless otherwise stated, all listed citations are published in English. Abbreviated mailing address information duplicates that provided by the abstracting service. Patents and Proceedings are reported only by their *Chemical Abstracts* citation number.]

1. Henry KD, Lovell JS. **Stroboscopic system and method for detecting substances, such as explosives and/or drugs, using, in part, short bursts of energy light from a relatively low energy strobe.** (Patent) *Chemical Abstracts* 2006;145:350077u.
2. Lingham AR, Hugel HM, Rook TJ. **Studies towards the synthesis of Salvinorin A.** *Australian Journal of Chemistry* 2006;59:340. [Editor's Notes: Presents the title study. Contact: RMIT University, School of Applied Sciences, Melbourne VIC 3001, Australia.]
3. Marchei E, Pellegrini M, Pacifici R, Zuccaro P, Pichini S. **A rapid and simple procedure for the determination of ephedrine alkaloids in dietary supplements by gas chromatography - mass spectrometry.** *Journal of Pharmaceutical and Biomedical Analysis* 2006;41(5):1633. [Editor's Notes: Used derivatization with pentafluoropropionic anhydride prior to analysis. Limits of detection were very low in SIM mode. Contact: 1<sup>st</sup> Super Sanita, Drug Control & Evaluat Dept, Viale Regina Elena 299, I-00161 Rome, Italy.]
4. Matsuda K, Asakawa N, Iwanaga M, Gohda A, Fukushima S, Ishii Y, Yamada H. **Conversion of gamma-hydroxybutyric acid to a fluorescent derivative: A method for screening.** *Forensic Toxicology* 2006;24(1):41. [Editor's Notes: GHB is converted to a fluorescent derivative using 3-bromomethyl-6,7-dimethoxy-1-methyl-1,2-dihydroquinoxaline-2-one. The focus is toxicological, but analysis of powdered and tableted forms of GHB is specifically mentioned in the abstract. Contact: Graduate School of Pharmaceutical Sciences, Kyushu University, 3-1-1 Maidashi, Higashi-ku, Fukuoka 812-8582, Japan.]
5. Mohamed R, Gremaud E, Tabet J-C, Guy PA. **Mass spectral characterization of ergot alkaloids by electrospray ionization, hydrogen/deuterium exchange, and multiple stage mass spectrometry: Usefulness of precursor ion scan experiments.** *Rapid Communications in Mass Spectrometry* 2006;20:2787. [Editor's Notes: Presents the title study; compounds include: Ergonovine, methysergide hydrogen maleinate, ergocristine, ergotamine, ergocornine, and *alpha*-ergokryptine. Contact: Department of Quality and Safety Assurance, Nestle Research Center, Nestec Ltd., P.O. Box 44, Vers-chez-les-Blanc, 1000 Lausanne 26, Switzerland. See also: Mohamed R, Gremaud E, Richoz-Payot J, Tabet JC, Guy PA. **Quantitative determination of five ergot alkaloids in rye flour by liquid chromatography - electrospray ionisation tandem mass spectrometry.** *Journal of Chromatography A* 2006;1114(1):62. ]
6. Xu YZ, Chen C. **Synthesis of deuterium labeled standards of 5-methoxy-N,N-dimethyltryptamine (5-MeO-DMT).** *Journal of Labelled Compounds & Radiopharmaceuticals* 2006;49(10):897. [Editor's Notes: Presents the synthesis of the trideuteromethoxy analogue. Contact: Natl Dong Hwa Univ, Dept Chem, Hualien 974, Taiwan.]

### Additional References of Possible Interest:

1. Fogassy E, Nogradi M, Kozma D, Egri G, Palovics E, Kiss V. **Optical resolution methods.** *Organic and Biomolecular Chemistry* 2006;4(16):3011. [Editor's Notes: An extensive review,

including traditional and new methodologies. Contact: Univ Technol & Econ, Inst Organ Chem Technol, POB 91, Budapest, Hungary.]

2. Kotrly M. **Use of X-ray diffraction in forensic sciences.** Materials Structure in Chemistry, Biology, Physics, and Technology 2006;13(2):113. [Editor's Notes: A review of the title topic. This article is written in Czech. Contact: Kriminalisticky Ustav Praha, Prague 170 89, Czech Rep.]
3. Mendelson J, Uemura N, Harris D, Nath R, Fernandez E, Jacob III P, Everhart ET, Jones RT. **Human pharmacology of the methamphetamine stereoisomers.** Clinical Pharmacology and Therapeutics 2006;80:403. [Editor's Notes: Presents an in-depth, comparative study of the effects of d- versus l- methamphetamine. Contact: Addiction Pharmacology Research Laboratory, 7th Floor, St. Luke's Hospital, 3555 Cesar Chavez, San Francisco, CA 94110.]

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## **New *Microgram* Editor Email Address, Effective January 1st, 2007**

Effective January 1st, 2007, the *Microgram* Editor's email address will change from [microgram\\_editor-at-mailsnare.net](mailto:microgram_editor-at-mailsnare.net) to: [microgram-2007-at-mailsnare.net](mailto:microgram-2007-at-mailsnare.net) This change has been necessitated by the ever-increasing numbers of spam emails being received at the [microgram\\_editor-at-mailsnare.net](mailto:microgram_editor-at-mailsnare.net) address. An automated response will be maintained on the [microgram\\_editor-at-mailsnare.net](mailto:microgram_editor-at-mailsnare.net) address for the first three months of CY 2007.

Please make a note of this change. Note that similar email address changes can be anticipated on the first of each year, substituting the appropriate year in the address.

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## **NEW EMAIL ADDRESSES NEEDED**

The email addresses for the following organizations returned rejection notices to the *Microgram* Editor for at least the past three issues of *Microgram Bulletin*, and therefore the respective organizations have been dropped from the subscription list. Note that the errors include "mailbox full", "over quota", "user not found", or "user unknown" messages, and also a variety of anti-spam/filtering rejection messages (the latter likely resulting from failure to "whitelist" the [microgram\\_editor@mailsnare.net](mailto:microgram_editor@mailsnare.net) address). The *Microgram* Editor requests your assistance in contacting these organizations, determining if they wish to remain on the *Microgram* subscription e-net, and if so asking them to forward a valid email address to the [microgram\\_editor@mailsnare.net](mailto:microgram_editor@mailsnare.net) address (after January 1st, 2007, to: [microgram-2007-at-mailsnare.net](mailto:microgram-2007-at-mailsnare.net)). In addition, if the Office has closed or is known to be no longer interested, please forward that information to the *Microgram* Editor.

### **U.S. Subscribers (by State):**

Idaho - Idaho State Police, District 1 Laboratory, Couer D'Alene; Idaho State Police, District 3

Laboratory, Meridian;

Nebraska - Physicians Laboratory Services, Omaha



Tennessee - Tennessee Bureau of Investigation, Regional Crime Laboratory, Knoxville;  
Texas - Friendswood Police Department  
U.S. Government - U.S. EPA, National Enforcement Investigations Center, Denver.

**Non-U.S. Subscribers (by Country):**

Japan - Yamagata Prefectural Police Headquarters, Forensic Science Laboratory, Yamagata.

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## **EMPLOYMENT OPPORTUNITY**

Position: **Forensic Chemist**

Location: Indian River Crime Laboratory; Fort Pierce, Florida

Salary: \$55,000 – \$65,000 depending on experience

Application Deadline: Open until filled

Duties: Responsibilities include the analysis of controlled substances; interpretation of laboratory analyses and results; preparation of written reports; and the ability to testify as an expert witness.

General Requirements: The applicant must be skilled in using gas chromatography, mass spectroscopy, ultraviolet and infrared spectrophotometry, and other drug analysis equipment and methodologies. A familiarity with the technical and safety requirements of ASCLD/LAB, and demonstrated proficiency testing in controlled substance analysis are required. A Master's degree in chemistry or forensic science (with chemistry undergraduate degree) and two years of forensic laboratory experience are preferred. Experience in head-space BAC analysis is desirable. An extensive background investigation is required, and laboratory personnel are subject to random drug testing. EEO.

Application Procedure: Applications may be obtained on-line at [stluciesheriff.com](http://stluciesheriff.com) or by contacting:

Saint Lucie County Sheriff's Office  
Human Resources Department  
4700 W. Midway Road  
Fort Pierce, FL 34981-4825  
Phone: (772) 462-3206; Fax: (772) 462-3218

For additional information about the position, contact:

Daniel C. Nippes, Director (or) Babu Thomas, Senior Criminalist  
Indian River Crime Laboratory  
2502 S. 35th Street  
Fort Pierce, FL 34981  
[dnippes-at-ircc.edu](mailto:dnippes-at-ircc.edu) (or) [bthomas-at-ircc.edu](mailto:bthomas-at-ircc.edu)  
Phone: (772) 462-3600

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[*Computer Corner* will return in January, 2007.]

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# Microgram

## *Bulletin*

Published by:  
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Office of Forensic Sciences  
Washington, DC 20537

The U.S. Attorney General has determined that the publication of this periodical is necessary in the transaction of the public business required by the Department of Justice. Information, instructions, and disclaimers are published in the January issues.

**VOL. XXXVIII, NO. 1**

**JANUARY 2005**

### **- INTELLIGENCE ALERT -**

#### **VERY LARGE SEIZURE OF DRIED KHAT IN BALTIMORE, MARYLAND**

The DEA Mid-Atlantic Laboratory (Largo, Maryland) recently received 187 boxes of plant material, suspected khat (origin not reported). The exhibit was seized in the Baltimore, Maryland area by U.S. Customs agents following a controlled delivery. Each box contained two packets of dried, semi-shredded green leaves packaged in plastic bags, which were concealed inside a thick layer of shredded brownish-green plant material (not identified) further contained in another plastic bag (see Photo 1, next page; displayed oversize to show detail). Each packet weighed an average of 5.6 kilograms, and was about 2.2 feet long by 1.5 feet in diameter. The green leafy material had a strong, nauseating odor, while the brownish-green plant material used to conceal it had an odor similar to basil or oregano. The total net mass of the combined plant material was approximately 2,400 pounds, while the total net mass of the suspected khat was 1,054 kilograms.

Khat is generally shipped cold and moist (usually in coolers, and often wrapped in wet paper and/or banana leaves) to slow the breakdown of cathinone (a Schedule I controlled substance, and a potent amphetamine-type stimulant) to cathine ((S)-norpseudoephedrine, a Schedule IV controlled substance with only mild stimulant effects). In this case, the exhibit was not fresh or kept cold, and is believed to have been dried or freeze-dried as an alternate means to preserve the cathinone. Analysis of extracts by GC and GC/MS indicated both cathinone and cathine,



**Photo 1**

confirming khat (not quantitated). The brownish-green plant material used to conceal the khat contained no controlled substances. The Mid-Atlantic Laboratory has previously received fresh khat; however, this was the laboratory's first encounter with dried or freeze-dried khat.

[Editor's Notes: This appears to be the largest seizure of khat ever reported to *Microgram Bulletin*. A previous seizure of dried khat (also referred to as "Graba") made in the Kansas City, Missouri area was reported in the April 2004 issue of *Microgram Bulletin*. A review of various Internet sources indicates that dried khat was only infrequently encountered in the U.S. or Europe prior to 2004. This latest seizure suggests that this form is becoming more mainstream.]

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### **- INTELLIGENCE ALERT -**

### **COCAINE CONTAINING DILTIAZEM ON THE WEST COAST**

The DEA Western Laboratory (San Francisco, California) recently received five separate suspected cocaine submissions containing an unknown diluent/adulterant. Three of the exhibits

were submitted as cocaine hydrochloride, while the other two were submitted as cocaine base. The samples originated from three separate cases in three different cities, including San Francisco, California, Fairbanks, Alaska, and Spokane, Washington, and were seized in September and October, 2004.

Analysis by FTIR and GC/MS confirmed cocaine hydrochloride in four of the five samples and cocaine base in one. However, the GC/MS also indicated an additional compound eluting after cocaine. It had a base peak of 58, a molecular ion peak of 414, and a number of other major fragment ions, including  $m/z = 71, 121, \text{ and } 150$ . A review of reference texts confirmed that the adulterant was diltiazem, a calcium-channel blocker and vasodilator used to treat high blood pressure and control chest pain. The average quantitation in the five exhibits was about 10 percent relative to the cocaine. These were the Western Laboratory's first encounters with diltiazem in any form.

[Editor's Notes: The identification of cocaine adulterated with diltiazem was first reported in the August 2004 issue of *Microgram Bulletin*. It is unknown whether diltiazem has any synergistic effect with cocaine, or is being added in a hopeful attempt to ameliorate some of the negative consequences of cocaine use, or is merely an adulterant of convenience; however, the latter explanation appears most likely. Since the above submissions, the Western Laboratory has received one additional sample of cocaine containing diltiazem, which was seized in Salt Lake City, Utah.]

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### **- INTELLIGENCE ALERT -**

#### **SUSPECTED PSILOCYBE MUSHROOM SPORES IN DETROIT, MICHIGAN**

The DEA North Central Laboratory (Chicago, Illinois) recently received three glass vials containing a clear solution, suspected Psilocybe mushroom spores in water. The exhibits were originally contained in three syringes, and were purchased in Detroit, Michigan by agents from the DEA Detroit Division (details withheld in accordance with *Microgram* policy). The total net weight and volume of the samples was 35.9 grams (40.0 milliliters).

A growth cycle was initiated for all three samples in order to determine whether or not Psilocybe mushrooms could be produced. A standard underground procedure was used (obtained from an Internet site; details withheld in accordance with *Microgram* policy). Mycelium growth was observed after about 3 weeks; however, only two small mushrooms grew (which were harvested after 78 days). Analysis of methanolic extracts of the two mushrooms by GC/MS indicated no controlled substances, suggesting that the mushrooms were not Psilocybe mushrooms. It is unclear whether the sale was a scam, or if the solution was contaminated during the transfer from the syringes to the vials, or if there was some other unknown problem with the solution or cultivation procedures. This is the first time that a mushroom grow has been performed at the North Central Laboratory.

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**- INTELLIGENCE ALERT -**

**VERY LARGE MARIJUANA GROW OPERATION SEIZED  
IN MERCED COUNTY, CALIFORNIA**

[From the NDIC *Narcotics Digest Weekly* 2004;3(50):1  
Unclassified, Reprinted with Permission.]

On November 3, 2004, the Fresno Bureau of Narcotic Enforcement (BNE) and California Methamphetamine Strategy (CALMS) team in a joint operation with the Drug Enforcement Administration (DEA), U.S. Forest Service, and the U.S. Bureau of Land Management culminated a 2-year investigation into U.S.-based members of the Pulido drug trafficking organization (DTO). During the investigation officers discovered that the DTO members were operating large cannabis grow sites on Forest Service lands in Central California. The head of this Pulido cell relied on the marijuana produced in California to supply his distributors; however, when the marijuana supply was depleted, he obtained Mexican marijuana from members of the Pulido DTO in Mexico.

Law enforcement officers served 18 search warrants and 12 arrest warrants on November 3 in Fresno, Merced, and Riverside Counties, which resulted in the arrests of 58 individuals connected with the Pulido DTO. One of the search warrants was executed at a suspected stash location in rural Merced County. This stash location was a fortified 10-acre ranch with a guard shack outside the front entrance. Upon arriving at the ranch, law enforcement officers observed 43 individuals fleeing from a large barn. A U.S. Department of Justice (DOJ) Aviation Unit helicopter was used to direct the individuals into a corner of the pasture where law enforcement officers were able to apprehend all but three who were able to escape. A subsequent search of the barn indicated that the 43 individuals were "part of an assembly line" and were drying and processing high-grade (sinsemilla) marijuana (see Photo 2, next page; displayed oversize to show detail). From their search of the barn, officers seized 3,640 pounds of marijuana, which was transported from the site in a 40-foot tractor-trailer. Officers also seized a loaded Uzi submachine gun as well as other guns and a ballistic vest from inside the guard shack; five additional firearms were seized from other areas of the ranch.

While members of the Pulido DTO were involved primarily in marijuana production and distribution, they also distributed powdered and crack cocaine and crystal methamphetamine from Southern California to Oregon. The DTO was the primary source of supply for many criminal groups and gangs in California. During the 2-year investigation, officers seized a total of 4,570 pounds of processed marijuana, 19,000 cannabis plants, 1.2 pounds of powdered methamphetamine, 1.1 pounds of crystal methamphetamine, 9 kilograms of powdered cocaine, 60 grams of crack cocaine, 19 weapons (3 of which were identified as having been stolen), 2 vehicles, and \$28,491.

NDIC Comment: Demand for high-grade marijuana has been increasing in the United States, and some Mexican DTOs responding to that demand may be providing more of a higher potency variety of the product. Historically, Mexican DTOs smuggled commercial-grade marijuana, which typically contained 2 to 5 percent THC (delta-9-tetrahydrocannabinol), to California from





**Photo 2**

Mexico. However, several years ago DTOs began producing high-grade marijuana, which often contains 10 to 20 percent THC, from cannabis cultivated on Forest Service lands in Northern and Central California. The Pulido DTO, in particular, hired Mexican nationals to tend the outdoor cannabis grow sites in California. These workers lived “in the fields” and pulled the male plants from the crop before the female plants were pollinated. The unpollinated female cannabis plants and resulting buds were used to produce high-grade marijuana.

\* \* \* \* \*

**- INTELLIGENCE ALERT -**

**35 MILLION CHINA-PRODUCED PSEUDOEPHEDRINE TABLETS SEIZED  
FROM CARGO AT PORT OF LONG BEACH, CALIFORNIA**

[From the NDIC *Narcotics Digest Weekly* 2004;3(50):3  
Unclassified, Reprinted with Permission.]

On November 11, 2004, U.S. Immigration and Customs Enforcement (ICE) agents seized 35 million China-produced pseudoephedrine tablets from a shipment of containerized cargo at the Port of Long Beach. Each of the 700 cases seized contained 100 bottles; each bottle contained

500 tablets. The cases were labeled with a brand name and tablet count; however, the bottles were not labeled. The tablets were shipped from China through the Port of Long Beach and destined for a fictitious company at a false address in Manzanillo, Mexico. In a possible attempt to conceal the cases of pseudoephedrine, they were stacked behind 40 cases of vitamin C. DEA agents and California BNE officers also participated in this investigation.

NDIC Comment: Successful law enforcement efforts targeting pseudoephedrine combined with tighter regulatory controls on the drug have greatly restricted the availability of bulk quantities of pseudoephedrine in Canada and the United States. Mexican DTOs and criminal groups that operate methamphetamine super labs had obtained bulk quantities of pseudoephedrine primarily from those two countries. Because bulk quantities of pseudoephedrine are no longer readily available in Canada or the United States, DTOs and criminal groups increasingly purchase pseudoephedrine from alternate sources of supply in Asia, particularly Japan, Taiwan, and Hong Kong. DTOs and criminal groups commonly smuggle Asia-produced pseudoephedrine in containerized cargo into the Port of Long Beach, which together with the Port of Los Angeles is the second busiest maritime port complex in the world. They then transport the drug overland to super labs in the United States and Mexico.

\* \* \* \* \*

#### **- INTELLIGENCE ALERT -**

### **CRYSTAL METHAMPHETAMINE LABORATORY SEIZURES INCREASE FIVEFOLD IN HAWAII**

[From the NDIC *Narcotics Digest Weekly* 2004;3(50):3  
Unclassified, Reprinted with Permission.]

Since January 1, 2004, Hawaii law enforcement officers have seized a record number of crystal methamphetamine laboratories - 30 - a fivefold increase from 2003, when 6 laboratories were seized. Most of the crystal methamphetamine laboratories seized this year were small labs used to convert powdered methamphetamine to crystal methamphetamine. In the past crystal methamphetamine produced in large-scale methamphetamine laboratories in California, Mexico, and Asia was transported to Hawaii from the continental United States on board commercial ships, which generally are not subject to inspection at the points of embarkation or debarkation.

NDIC Comment: Crystal methamphetamine is the form most commonly abused in Hawaii and, since the late 1990s, demand for the drug has increased steadily due in part to its addictive nature. By purchasing less expensive powdered methamphetamine from Mexican DTOs and converting the powder to crystal in Hawaii, local DTOs can increase their profits considerably. Therefore, the number of conversion laboratories in the state most likely will increase significantly in the future. Conversion laboratories are easy to conceal because they are small and can be set up in a storage room, closet, bathroom, or even in the trunk of a car or a cardboard box. Although the vapors from the solvents used in the conversion process are extremely volatile and noxious, the smell emitted can dissipate quickly if the process is completed outdoors or in an area with adequate ventilation. The cost to clean up one conversion laboratory ranges



from \$2,000 to \$10,000, depending on its size. If the number of laboratory seizures continues to increase, the cleanup costs alone will place a severe burden on Hawaii's taxpayers.

\* \* \* \* \*

**- INTELLIGENCE BRIEF -**

**LARGEST METHAMPHETAMINE LABORATORY IN BAY COUNTY,  
FLORIDA HISTORY SEIZED**

[From the NDIC *Narcotics Digest Weekly* 2004;3(49):3  
Unclassified, Reprinted with Permission.]

On October 20, 2004, Bay County Sheriff's Office Methamphetamine Drug Unit (MAD) officers seized an operational methamphetamine laboratory - the largest in the county's history - 17.4 liters of methamphetamine oil, and arrested the laboratory operators after one accidentally dialed 9-1-1. When a sheriff's deputy responded to the inadvertent 9-1-1 call made from a house located in a residential neighborhood in Callaway, a man and woman met him outside and tried to assure him that they had made the call by mistake. While conversing with the couple, the deputy noticed a strong chemical smell coming from the house and called the MAD Unit, whose officers confirmed the chemical odor as one consistent with a methamphetamine laboratory. That confirmation and information gathered from tips regarding narcotic activity at the residence enabled MAD officers to obtain a warrant to search the three-bedroom house. Once inside the house, MAD officers discovered a red phosphorus methamphetamine laboratory believed to have been in operation less than 2 months. Officers described the residence as a "giant meth lab" and reported that every room in the house was being used for various stages of methamphetamine production. A 44-year-old Caucasian male and 43-year-old Caucasian female were charged with methamphetamine trafficking (over 200 grams) as well as 12 felonies, which included weapons charges. Officers reported that the 17.4 liters (4.6 gallons) of methamphetamine oil seized at this laboratory would have yielded approximately 12.2 kilograms (26.9 pounds) of powdered methamphetamine.

NDIC Comment: In response to the methamphetamine threat posed to Bay County, the sheriff's office initiated the MAD Unit in October 2003. This multiagency task force expects to reduce the number of methamphetamine producers in the county by fostering cooperation between citizens, law enforcement, and health care providers. Since the inception of the MAD Unit, the number of methamphetamine laboratories seized in the county has increased, while distribution and abuse of the drug have decreased. As of November 11, 2004, 96 methamphetamine laboratories have been seized in Bay County [in 2004]; 77 laboratories were seized in 2003, 30 in 2002, and 17 in 2001.

\* \* \* \* \*      \* \* \* \* \*      \* \* \* \* \*      \* \* \* \* \*      \* \* \* \* \*

## SELECTED REFERENCES

[Notes: Selected references are a compilation of recent publications of presumed interest to forensic chemists. Unless otherwise stated, all listed citations are published in English. Listed mailing address information (which is sometimes cryptic or incomplete) exactly duplicates that provided by the abstracting services. Starting January 2005, patents will be reported only by their *Chemical Abstracts* citation number.]

1. Aalberg L, DeRuiter J, Sippola E, Clark CR. **Gas chromatographic optimization study on the side chain and ring regioisomers of methylenedioxymethamphetamine.** *Journal of Chromatographic Science* 2004;42(6):293. [Editor's Notes: Includes the analysis of 10 isomeric compounds (not specified in the abstract). Contact: Department of Pharmaceutical Sciences, School of Pharmacy, Auburn University, Auburn, AL 36849.]
2. Adamowicz P, Zuba D, Kala M. **Ketamine: A new substance on the Polish drug market.** *Z Zagadnien Nauk Sadowych* 2004;56:26. [Editor's Notes: Presents a case analyzed by the laboratory, along with some background concerning the title subject. Contact: Institute of Forensic Research, Krakow, Pol.]
3. Avula B, Khan IA. **Separation and determination of ephedrine enantiomers and synephrine by high performance capillary electrophoresis in dietary supplements.** *Chromatographia* 2004;59(1-2):71. [Editor's Notes: The title study was applied to E. Sinica and various dietary supplement products. The enantiomers of norephedrine, norpseudoephedrine, ephedrine, pseudoephedrine, N-methylephedrine, and N-methylpseudoephedrine were separated. Contact: Univ Mississippi, Sch Pharm, Natl Ctr Nat Prod Res, Res Inst Pharmaceut Sci, University, MS 38677.]
4. Butler D, Guilbault GG. **Analytical techniques for ecstasy.** *Analytical Letters* 2004;37(10):2003. [Editor's Notes: A review, including current analytical methods. Contact: Natl Univ Ireland, Univ Coll Cork, Dept Chem, Cork, Ireland.]
5. Choi YH, Kim HK, Hazekamp A, Erkelens C, Lefeber AWM, Verpoorte R. **Metabolomic differentiation of Cannabis sativa cultivars using 1H NMR spectroscopy and principal component analysis.** *Journal of Natural Products* 2004;67:953. [Editor's Notes: Cultivars could be differentiated by measurement of *delta*-9-tetrahydrocannabinolic acid and cannabidiolic acid. Contact: Division of Pharmacognosy, Section Metabolomics, Institute of Biology, Leiden University, P.O. Box 9502, 2300 RA Leiden, The Netherlands.]
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7. Hazekamp A, Simons R, Peltenburg-Looman A, Sengers M, van Zweden R, Verpoorte R. **Preparative isolation of cannabinoids from Cannabis sativa by centrifugal partition chromatography.** *Journal of Liquid Chromatography & Related Technologies* 2004;27(15):2421. [Editor's Notes: Seven major cannabinoids were isolated in large scale and better than 90 percent purity. Contact: Leiden Univ, Inst Biol, Div Pharmacognosy, Einsteinweg 55, NL-2300 RA Leiden, Netherlands.]

8. Ishibashi H. **Analysis of stable isotope ratio of carbon and nitrogen, as a powerful tool to identify smuggling routes of illegal drugs.** Kagaku to Kogyo 2004;57(9):964. [Editor's Notes: A review of the title topic, including discussion of application to methamphetamine and MDMA. This article is written in Japanese. Contact: Moji Customs, Japan (no further addressing information was provided).]
9. Karetnikov MD, Meleshko EA, Yakovlev GV. **Detection, identification, and localization of organic substances, including explosive and narcotic substances, using pulsed fast neutrons.** Chemical Abstracts 2004:894555.
10. Karpiesiuk W, Lehner AF, Hughes CG, Tobin T. **Preparation and chromatographic characterization of tetrahydrogestrinone, a new "designer" anabolic steroid.** Chromatographia 2004;60(5-6):359. [Editor's Notes: The synthesis of THG from gestrinone is reported. Contact: Univ Kentucky, Dept Vet Sci, Maxwell H Gluck Equine Res Ctr, Lexington, KY 40546.]
11. Kawase K, Ogawa Y, Watanabe Y. **Component pattern analysis of chemicals using multispectral THz-imaging system.** Proceedings of SPIE - The International Society for Optical Engineering. 2004;5354:63. [Editor's Notes: A minor review of the title topic. Includes discussion of the application of the technique for the detection of methamphetamine and MDMA concealed in envelopes. Contact: RIKEN, 2-1 Hirosawa, Wako, Japan 351-0198.]
12. Kochana J, Wilamowski J, Parczewski A. **TLC profiling of impurities of 1-(3,4-methylene-dioxyphenyl)-2-nitropropene, an intermediate in MDMA synthesis. Influence of sample preparation methods and conditions.** Journal of Liquid Chromatography & Related Techniques 2004;27(15):2463. [Editor's Notes: Presents the title study. Contact: Jagiellonian Univ, Fac Chem, Dept Analyt Chem, Ingardena 3, PL-30060 Krakow, Poland.]
13. Laks S, Pelander A, Vuori E, Ali-Toippa E, Sippola E, Ojanpera I. **Analysis of street drugs in seized material without primary reference standards.** Analytical Chemistry 2004;76(24):7375. [Editor's Notes: Uses a combination of LC-Time-of-Flight-MS and LC-Chemiluminescence Nitrogen Detection on 21 samples (different drugs). The results were found to be reasonable, with variances from established methods ranging from 4 to 21 percent, and only one apparent false positive. Contact: Department of Forensic Medicine, University of Helsinki, P.O. Box 40, FIN-00014 Helsinki, Finland.]
14. Moldvai I, Temesvari-Major E, Incze M, Szentirmay K, Gacs-Baitz E, Szantay C. **Enantioefficient synthesis of alpha-ergocryptine: First direct synthesis of (+)-lysergic acid.** Journal of Organic Chemistry 2004;69(18):5993. [Editor's Notes: Presents the title synthesis. Contact: Hungarian Acad Sci, Inst Biomol Chem, Chem Res Ctr, POB 17, H-1525 Budapest, Hungary.]
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18. Rothweil M. Bader HJ. **Drug analysis: Rapid tests for the analysis of "classical" narcotics.** Praxis der Naturwissenschaften, Chemie in der Schule 2004;53(5):23. [Editor's Notes: A minor review of the title subject, directed towards high school and college teachers. This article is written in German. Contact: Institut fuer Didaktik der Chemie, Universitaet Frankfurt, 60439 Frankfurt, Germany.]
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21. Wall DB, Finch JW, Cohen SA. **Quantitation of codeine by desorption/ionization on silicon time-of-flight mass spectrometry and comparisons with liquid chromatography/mass spectrometry.** Rapid Communications in Mass Spectrometry 2004;18:1403. [Editor's Notes: Presents the title analysis, including analyses of standards and a liquid pharmaceutical preparation. Contact: Waters Corporation, Milford, MA 01757.]
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23. Zvilichovsky G, Gbar-Haj-Yahia I. **Birch reduction of (-)-ephedrine formation of a new, versatile intermediate for organic synthesis.** Journal of Organic Chemistry 2004;69(16):5490. [Editor's Notes: The Li/NH<sub>3</sub> reduction of (-)-ephedrine gave S-1-(1,4-cyclohexadien-1-yl)-methyl-2-propanamine. Contact: Hebrew Univ Jerusalem, Dept Organ Chem, IL-91904 Jerusalem, Israel.]

### Additional References of Possible Interest:

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2. Hoang TH, Cuerrier D, McClintock S, Di Maso M. **Computer-assisted method development and optimisation in high-performance liquid chromatography.** *Journal of Chromatography A* 2003;991:281. [Editor's Notes: Uses DryLab simulation software. Contact: Dept. Of Pharmaceutical Research and Development, Merck Frosst Canada & Co., P.O. Box 1005, Pointe Claire-Dorval, Quebec H9R 4P8, Canada.]
3. Kratzsch C, Tenberken O, Peters FT, Weber AA, Kraemer T, Maurer HH. **Screening, library-assisted identification and validated quantification of 23 benzodiazepines, flumazenil, zaleplone, zolpidem, and zopiclone in plasma by liquid chromatography/mass spectrometry with atmospheric pressure chemical ionization.** *Journal of Mass Spectrometry* 2004;39(8):856. [Editor's Notes: The focus is toxicological. Contact: Univ Saarland, Inst Expt & Clin Pharmacol & Toxicol, Dept Expt & Clin Toxicol, D-64421 Homburg, Germany.]
4. Lambert W. **Pitfalls in LC-MS(-MS) Analysis.** *Toxichem und Krimtech* 2004;71(2):64. [Editor's Notes: Language not specified in the abstract (may be in German). Presents the title review. Appears to be a re-publication of the article by the same author and title in *Bulletin TIAFT* 2004;28(6):439. Contact: Laboratorium voor Toxicologie, Universiteit Gent, Harelbekestraat 72, B-9000 Gent, Belgium.]
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6. Tidgewell, Harding WW, Schmidt M, Holden KG, Murry DJ, Prisinzano TE. **A facile method for preparation of deuterium labeled salvinorin A: Synthesis of [2,2,2-H-2(3)]-salvinorin A.** *Bioorganic & Medicinal Chemistry Letters* 2004;14(20):5099. [Editor's Notes: For use as an internal standard in LC/MS analyses of biological fluids. Contact: Univ Iowa, Coll Pharm, Div Med & Nat Prod Chem, Iowa City, IA 52242.]
7. Van Thuyne W, Delbeke FT. **Validation of a GC-MS screening method for anabolizing agents in solid nutritional supplements.** *Biomedical Chromatography* 2004;18(3):155. [Editor's Notes: Presents the title study, including analyses of testosterone, nandralone, stanazolol, metandienone, and various prohormones. Contact: Doping Control Laboratory, Ghent University, B-9820 Merelbeke, Belg.]

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## THE JOURNAL/TEXTBOOK COLLECTION EXCHANGE

There were no offerings of journals or textbooks made over the past quarter.

**Subscribers are encouraged to donate surplus or unwanted items or collections; if interested, please consult the *Microgram* website or contact the *Microgram* Editor for further instructions.**

The next offering of journals and textbooks will be in the April 2005 issue of *Microgram Bulletin*.

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## THE DEA FY - 2005 STATE AND LOCAL FORENSIC CHEMISTS SEMINAR SCHEDULE

The remaining FY - 2005 schedule for the DEA's State and Local Forensic Chemists Seminar is as follows:

May 9 - 13, 2005

July 11 - 15, 2005

September 19 - 23, 2005

Note that the school is open only to forensic chemists working for law enforcement agencies, and is intended for chemists who have completed their agency's internal training program and have also been working on the bench for at least one year. There is no tuition charge for this course. The course is held at the AmeriSuites Hotel in Sterling, Virginia (near the Washington/Dulles International Airport). A copy of the application form is reproduced on the last page of the August 2004 issue of *Microgram Bulletin*. Completed applications should be mailed to the Special Testing and Research Laboratory (Attention: Pam Smith or Jennifer Kerlavage) at: 22624 Dulles Summit Court, Dulles, VA 20166. For additional information, call 703/668-3337.

\* \* \* \* \*

## Computer Corner

### Digital Evidence Worksheet Design

## #190

by Michael J. Phelan  
DEA Digital Evidence  
Laboratory

One of the cornerstones of all forensic examinations is a well documented description of the evidence and a list of the key examination processes that were used to recover information. The DEA Digital Evidence Laboratory has utilized worksheets for nearly a decade as its principal means to

accomplish these tasks. Recently, the Laboratory finalized the third iterations of its various worksheets. These latest versions accurately record the sequential evidence handling and processing steps currently utilized at the Laboratory. The worksheets provide a formal structure to ensure that

descriptive information is uniformly collected and that the examination processes are thoroughly documented. Laboratory management conducts a technical review on 100 percent of its worksheets and case notes to ensure that all required information is properly recorded.



A worksheet can document a wide array of examination information, including: 1) Evidence Description; 2) Evidence Receipt and Handling; 3) Evidence Duplication and Verification; 4) Examination Techniques Used; 5) Examination Tools Used; 6) Anti-Virus Software Scan Results; 7) Evidence Archive Information; 8) Customer Information and Scope of Examination Request; and 9) a Legal Search Document Review.

Wide variations in worksheets are common. Regardless of form, however, an agency's records management, evidence handling, and quality assurance policies should be accurately reflected in its worksheets.

Examination worksheets can be quite complex to design because there can be a great variety of evidence submissions and possible evidence handling combinations. For example, larger digital evidence laboratories (or programs) can have multiple examiners working on the same case (or even portions of the same exhibit). It is important that the worksheet accurately document what each examiner did as part of the examination process.

DEA has had three iterations of its worksheets. The initial worksheet (Version 1) was a one page document that described the evidence, listed the total amount of storage capacity searched, and recorded significant events (passwords, computer viruses, etc.). It mainly served as an information database to answer management questions. The

next version of the worksheets (Version 2) consisted of multiple forms that described the case, the evidence, the imaging/duplication process, and the examination tools and processes that were used. These were the first effort to comprehensively document the entire examination process. The latest iteration of the worksheets (Version 3) improved Version 2 by updating the examination milestones to both reflect several key ASCLD/LAB requirements and better accommodate multiple examiners working on the same case or same exhibit. Examples of ASCLD/LAB requirements include: 1) Use of controls prior to imaging or examination; 2) Verification that the examination platform and media were prepared prior to imaging or examination; 3) Annotations in the instrument log books; and 4) Use of hard drive write blocking. In addition, all Version 3 worksheets include a line for the technical reviewer(s) to initial (required) as well as a line to indicate who placed the worksheet in the examination case file folder.

Other additions to the Version 3 worksheets include: 1) An evidence repackaging report to document efforts to prevent deleterious change to digital evidence submissions that are improperly packaged; and 2) A form used on-site to document evidence as part of the technical collection process. These latter forms are only used when the situation warrants.

Included are copies of the Version 3 worksheets currently

utilized by DEA's Digital Evidence Laboratory [Editor's Note: The forms have been reproduced at about 90 percent original in order to fit the size limitations of *Microgram Bulletin*]. DEA has found that a comprehensive, structured worksheet aids in ensuring consistency and thoroughness of analysis. However, worksheets alone do not completely satisfy the documentation of the evidence examination process, because findings and their associated storage location information and meta-data (time/date stamp and file ownership rights) must also be documented. Such information is often highly variable, and is therefore most easily documented in the examiner's chronological examination notes.

Comments or Questions?  
E-mail: Michael.J.Phelan -at- usdoj.gov

#### Attachments:

- A) Case Examination Worksheet
- B) Case Examination Worksheet; Continuation 1
- C) Case Examination Worksheet; Continuation 2
- D) Exhibit Worksheet
- E) Examination Tools Worksheet
- F) On-Site Summary Worksheet
- G) Exhibit Repackaging Report



U.S. Department of Justice  
Drug Enforcement Administration  
Digital Evidence Laboratory (SFL9)

Case Examination Worksheet

Case Number: \_\_\_\_\_ Submitting Office: \_\_\_\_\_  
Case Agent: \_\_\_\_\_ Agent Phone #: \_\_\_\_\_

Case Management Plan

Tasks	Exhibit # →	1	2	3	4	5	6	7	8	9	10
<b>Case Folder</b>		<b>Initials</b>									
• Organized case file											
• Reviewed case related documentation											
• Coordinated with case agent (obtained scope, keywords, and priorities)											
• Completed case work sheets											
• Documented examination (case notes)											
• Prepared DEA-6 Report of Examination											
<b>Evidence Handling</b>											
• Inspected seals upon receipt											
• Reviewed DEA-12 / verified return											
• Verified / documented exhibits / sub-exhibits											
• Recorded laboratory number											
• Marked items with examiner markings											
• Prepared "return" DEA-12											
• Returned original evidence to vault											
• Sealed duplicate evidence (archive copy)											
• Returned duplicate evidence to archive											
<b>Imaging</b>											
• Prepared storage media											
• Prepared forensic platform											
• Performed control prior to imaging											
• Annotated instrument log book											
• Utilized write-blocking											
• Obtained acquisition/verification report (hash report)											
• Created duplicate copy of images (archive copy)											
• Restored/verified archive & produced report (hash report)											
<b>Examination</b>											
• Reviewed case related documentation											
• Prepared forensic platform											
• Performed control prior to examination											
• Identified software used											

Placed in Case Folder By: \_\_\_\_\_ Date: \_\_\_\_\_

Page \_\_\_\_ of \_\_\_\_

Version: 3.1

Case #: \_\_\_\_\_

	1	2	3	4	5	6	7	8	9	10
• Completed Anti-Virus scan										
• Obtained CMOS / VM information										
• Obtained registry information (owner info, shutdown time, etc)										
• Identified users / logins / passwords										
• Identified Internet access mode (dialup, DSL, cable)										
• Obtained file listing w/ properties (timeline) (last modified/accessed/created dates and times, & hash values)										
• Performed negative hash										
• Analyzed file signatures (non-matching)										
• Conducted keyword search										
• List email addresses										
• Examined email and chat files										
• Examined voicemail and text messages (cell phones, pagers, PDAs, etc)										
• Examined cell phone call history (outgoing, incoming, & missed calls)										
• Examined contact/address books										
• Examined Internet files										
• Examined document and spreadsheet files (all types)										
• Examined financial data										
• Examined image and audio files										
• Examined compressed and link files										
• Examined unallocated/slack file space										
• Examined swap/page files										
• Examined deleted files and folders										
• Identified encryption & Steganography (files and software)										
• Cracked passwords										

**Case Review**

Exhibit #	Tech Review		Admin Review		Comments
	Initials	Date	Initials	Date	

Placed in Case Folder By: \_\_\_\_\_ Date: \_\_\_\_\_

Page \_\_\_\_ of \_\_\_\_

Version: 3.1

### Evidence submitted

[illegible]

### Sub-exhibits identified

☐ NONE[illegible]

Placed in Case Folder By: \_\_\_\_\_ Date: \_\_\_\_\_

Page \_\_\_\_ of \_\_\_\_

Version: 3.1

Case #: \_\_\_\_\_ On-Site Location: \_\_\_\_\_

<b>Description of Computer</b>		<input type="checkbox"/> NOT AVAILABLE / APPLICABLE	Initials _____
Type	Manufacturer	Model	Serial Number
Inventory:			
Condition:			

<b>CMOS/BIOS Information</b>	<input type="checkbox"/> NOT AVAILABLE / APPLICABLE	Initials _____
System Date/Time: _____	Current Date/Time: _____	

<b>Description of Media</b>				Initials _____
Media	Manufacturer	Model	Serial Number or ESN	Capacity
Condition				

<b>Imaging Information</b>					<input type="checkbox"/> NOT AVAILABLE / APPLICABLE	Action By: _____
Type Image	Program / Version / Mode	Platform Used / DEA #	Verified Method	Date		
Write Block Method						
File Name:						
Report Location:						

<b>Archiving Information</b>						<input type="checkbox"/> NOT AVAILABLE / APPLICABLE	Action By: _____
Program / Version	Media Used	Qty	Verified Method	Heat Seal #	Date		
Report Location:							

<b>Restoring Information</b>						<input type="checkbox"/> NOT AVAILABLE / APPLICABLE	Action By: _____
Program / Version	Media	Qty	Verified Method	Heat Seal #	Date		
Report Location:							

**NOTES:** \_\_\_\_\_

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\_\_\_\_\_

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Image Reviewer: \_\_\_\_\_ Date: \_\_\_\_\_ Placed in Case Folder By: \_\_\_\_\_ Date: \_\_\_\_\_

Case Reviewer: \_\_\_\_\_ Date: \_\_\_\_\_

Page \_\_\_\_ of \_\_\_\_

Version: 3.1



<b>Base Examination Software</b>	<input type="checkbox"/> NOT AVAILABLE / APPLICABLE	Initials _____
<input type="checkbox"/> EnCase      Version: _____ <input type="checkbox"/> ILook        Version: _____ <input type="checkbox"/> Other         _____		

[illegible]

<b>Computer Virus Detection</b>		<input type="checkbox"/> NOT AVAILABLE / APPLICABLE	Initials: _____
Software Used: _____		Signature Date: _____	
Checked	<input type="checkbox"/> Original	<input type="checkbox"/> Working Copy	<input type="checkbox"/> Findings CD
	<input type="checkbox"/> Other Files ( ID in Remarks)		
No Virus Detected:	<input type="checkbox"/>		
Virus Detected:	_____		
Action Taken:	_____		
Remarks:	_____		

Version: 3.0



Supporting Examiners:

Other items submitted for evidence collection: \_\_\_\_\_

Remarks: \_\_\_\_\_

Version: 3.0



U.S. Department of Justice  
Drug Enforcement Administration  
Digital Evidence Laboratory (SFL9)

Exhibit Repackaging Report

Case #: \_\_\_\_\_ Exhibit #: \_\_\_\_\_ Lab #: \_\_\_\_\_

Date of Receipt at Vault: \_\_\_\_\_ Evidence Technician/Supervisor's Initials: \_\_\_\_\_

Observed Concerns at Intake (Condition):

- CDs or DVDs not packaged in protection sleeve or jewel case. \_\_\_\_\_
- External Hard Drive not packaged with shock resistant material  
(Such as Bubble wrap, Styrofoam, Plastic Shipping Case.) \_\_\_\_\_
- Computer case containing internal component not secured. \_\_\_\_\_
- Evidence not under seal. \_\_\_\_\_
- Other: \_\_\_\_\_
- Condition: \_\_\_\_\_

Evidence Technician notified Laboratory Manager:

- Notification to: \_\_\_\_\_
- Date of Notification: \_\_\_\_\_

Directed Action:

- Forwarded to Imaging Team on: \_\_\_\_\_ or
- Evidence Technician repackaged evidence.  
Name: \_\_\_\_\_ Date: \_\_\_\_\_

Notes: \_\_\_\_\_

Reviewer: \_\_\_\_\_ Date: \_\_\_\_\_ Placed in Case Folder By: \_\_\_\_\_ Date: \_\_\_\_\_

Page \_\_\_\_ of \_\_\_\_

Version: 3.0

## Information and Instructions for *Microgram Bulletin*

[Editor's Preface: The following information and instructions are derived from the *Microgram* website < <http://www.dea.gov/programs/forensicsci/microgram/index.html> >, and are provided here for the convenience of those subscribers who do not have access to the Internet.]

### **General Information**

*Microgram Bulletin* is a monthly newsletter published by the U.S. Drug Enforcement Administration's Office of Forensic Sciences, and is primarily intended to assist and serve forensic scientists concerned with the detection and analyses of suspected controlled substances for forensic/law enforcement purposes.

### **Subscriptions to Microgram Bulletin**

*Microgram Bulletin* is unclassified (as of the January 2003 issues), and is published on the DEA public access website (see the above URL). **Private citizens should use the website to access *Microgram Bulletin*.** Professional scientific and law enforcement personnel may either use the website or request a subscription. Subscriptions are available electronically and in hard copy. Electronic subscriptions require Internet access. The publications themselves will not be sent electronically to any subscriber; rather, an email notification of the pertinent URL will be sent to the subscriber when the respective issue is posted on the website (see additional information on email notifications, below). Requests for hard copies are strongly discouraged, and should be limited to those offices that do not have access to the Internet, require hard copies for their libraries, or have some other valid reason (Note: "For my personal collection" is not considered to be a valid reason). Requests for hard copies should indicate the number of copies required (maximum of two allowed per office), and should also include formal justification. Note that due to publication delays beyond the control of the Office of Forensic Sciences, hard copies will arrive from 30 to 180 days after electronic posting.

Requests to be added to the subscription list should be submitted via email to the *Microgram* Editor at: [microgram\\_editor@mailsnare.net](mailto:microgram_editor@mailsnare.net) If email submission is not possible, requests should be mailed to: *Microgram* Editor, Drug Enforcement Administration, Office of Forensic Sciences, 2401 Jefferson Davis Highway, Alexandria, VA 22301. All requests to be added to the *Microgram* mailing list should include the following **Standard Contact Information**:

- \* The Full Name and Mailing Address of Submitting Laboratory or Office;
- \* The Full Name, Title (Laboratory Director, Assistant Special Agent in Charge, Librarian, etc.), Phone Number, FAX Number, and Preferred email Address of the Submitting Individual (Note that subscriptions are mailed to titles, not names, in order to avoid subscription problems arising from future personnel changes);
- \* If available, the generic email address for the Submitting Laboratory or Office;
- \* If a generic email address is not available, **one** private email address for an individual who is likely to be a long-term employee, who has a stable email address, and who will be responsible for forwarding *Microgram* information to all of the other employees in the requestor's Office (Note that only one email address per Office will be honored);
- \* If requesting hard copy mailings, the number of copies requested (two max), and justification.

Requests to be removed from the *Microgram* subscription list, or to change an existing subscription, should also be sent to the *Microgram* Editor. Such requests should include all of the pertinent standard contact information detailed above, and also should provide the email and/or hard mail address currently being utilized for the requestor's subscription.

Note that, due to mailing delays and/or publication timeframes, subscription requests/changes may take as long as 90 days to implement.

#### **Email Notifications** (Additional Comments)

As noted above, electronic subscriptions are email based. The email provides a notification of the *Microgram* URL when a new issue is posted, and additional information as appropriate. Note that *Microgram* notices will NEVER include any attachments, or any hyperlink other than the *Microgram* URL. This is important, because the [microgram\\_editor@mailsnare.net](mailto:microgram_editor@mailsnare.net) address is routinely hijacked and used to send spam, very commonly including malicious attachments. For this reason, all subscribers are urged to have current Anti-Viral, Anti-Spyware, and Firewall programs in operation.

#### **Costs**

Subscriptions to *Microgram* are free.

#### **Submissions to *Microgram Bulletin***

*Microgram Bulletin* includes Intelligence Alerts, Safety Alerts, Intelligence Briefs, Selected Intelligence Briefs, Selected Literature References, Meeting Announcements, Employment Opportunities, pertinent sections from the Code of Federal Regulations, Columns of topical importance, and similar material of interest to the counter-drug community. Explanatory details for most of the above types of submission are detailed below, and typical examples are provided in most issues of *Microgram Bulletin*.

All submissions must be in English. Because *Microgram Bulletin* is unclassified, **case sensitive information should not be submitted!** All submissions should, whenever possible, be submitted electronically, as straight email or as an IBM® PC-compatible Corel WordPerfect® or Microsoft Word® attachment, to: [microgram\\_editor@mailsnare.net](mailto:microgram_editor@mailsnare.net) Current versions of Corel WordPerfect® or Microsoft Word® (defined as having release dates less than 5 years old) should be utilized. If email submission is not possible, submissions may be mailed to: *Microgram* Editor, Drug Enforcement Administration, Office of Forensic Sciences, 2401 Jefferson Davis Highway, Alexandria, VA 22301. Hard copy mailings should be accompanied by an electronic version on a 3 ½ inch IBM® PC-compatible diskette. **Note that diskettes should be mailed in an irradiation-proof protective sleeve, and the mailing envelope should be marked: "Warning - Contains Electronic Media - Do Not Irradiate"**. Note also that mailed submissions may be subject to lengthy handling delays beyond the control of the Office of Forensic Sciences, and electronic media sent through the mail may be destroyed en route by sanitizing procedures, despite protective measures and written warnings. All submissions should include the following **Contact Information:** The Full Name and Address of Submitting Laboratory or Office, and the Full Name, Phone Number, FAX Number, and Preferred email Address of the Submitting Individual.

**Intelligence Briefs** are concise synopses of the physical and chemical characteristics of novel and/or interesting exhibits submitted to law enforcement laboratories involved in the detection and analyses of suspected controlled substances for forensic/law enforcement purposes. They should include descriptive details adhering to (as appropriate) the following outline:

What laboratory did the analysis?  
Where is the laboratory located?  
What agency seized the exhibit?  
Where was the exhibit seized?  
Were there any special circumstances of the seizure (unusual smuggling technique, etc.)  
What controlled substance was suspected upon submission?  
Detailed physical description (appearance, dimensions, logos, odor, packaging, etc.)  
Quantities (numbers of tablets, packages or bricks, average mass, net mass, etc.)  
Photos (jpeg images preferred)  
What techniques were used to analyze the exhibit?  
Actual identity of the exhibit?  
Quantitation data? (if approximate, so state)  
Adulterants and diluents? (if identified)  
First seizure of this type? (if not, provide brief details of previous examples)  
Editorial comments? (if any)  
Literature references? (If any)

In order to avoid confusion, if uncommon controlled substances are identified, the description should use the full chemical name(s) of the identified substances (if desired, acronyms or street terminology (e.g., “Foxy-Methoxy”, “Nexus”, or “STP”) can be included in parentheses after the full chemical name).

Photographs should be provided as ATTACHMENTS, not as embedded images in documents. Jpeg images are preferred. Photographs should be of reasonable size - 250 KB or less per photograph. Unless the scale is obvious (which is uncommon), photographs of subject exhibit(s) should include either a metric ruled scale or a coin or bill (U.S. currency) to place the exhibit's size in context.

**Intelligence Alerts and Safety Alerts** are urgent communiques to the *Microgram Bulletin* readership which give notice of a specific forensic/drug-related enforcement and/or safety issue. In addition to the descriptive details listed under “Intelligence Briefs” above, they should include a concise synopsis of the issue, recommendations (if any), pertinent literature citations (if any are known), and a mechanism for providing feedback (if appropriate).

**Selected Intelligence Briefs** are reprinted (with permission) unclassified intelligence briefs of presumed interest to the *Microgram Bulletin* readership that have been previously published in restricted or non-restricted publications or websites that are also dedicated to the detection and analyses of suspected controlled substances for forensic/law enforcement purposes. Selected Intelligence Briefs must be unclassified, and should be a minimum of 1 page and a maximum of 10 pages in length (single spaced at 11 pitch Times New Roman font, including photos, tables, charts, etc.) All *Microgram Bulletin* subscribers are invited to submit such material, which must include the author's and publisher's contact information.

**Selected Literature References** is a monthly compilation of reference citations of presumed interest to the *Microgram Bulletin* readership, derived from approximately 2500 scientific periodicals. The focus of the Selected Literature References is the detection and analysis of suspected controlled substances for forensic/law enforcement purposes. References from clinical and toxicological journals are included only if the material is considered to be of high interest to forensic chemists (for example, contains the mass spectra of an unusual substance that is not known to be published elsewhere). Note that citations from obscure periodicals may be missed, and all *Microgram Bulletin* subscribers are invited to submit citations of interest if they do not appear in *Microgram Bulletin* within three months of their publication. Citations should include a summary sentence and the primary author's contact information.

**Meeting Announcements** is a monthly compilation of upcoming meetings of presumed interest to the *Microgram Bulletin* readership. **In general, only meetings which are dedicated to forensic chemistry/forensic drug analysis or include a subsection so dedicated will be publicized in *Microgram Bulletin*.** Meeting Announcements should include the Formal Title, Sponsoring Organization, Inclusive Dates, Location (City, State, and specific locale), Meeting Registration Costs and Deadline, Recommended Hotel Registration Costs and Deadline (include details on special rates where available), and Contact Individual's Name, Phone Number, and email Address. If available, the URL for the meeting website should also be included in the Announcement. Meeting Announcements will be posted for a maximum of three consecutive months, or (alternately) three times every other month over a five month period, but not past the registration deadline.

**Employment Opportunities** is a monthly compilation of job announcements of presumed interest to the *Microgram Bulletin* readership. **In general, only jobs with a forensic chemistry/forensic drug analysis focus for Federal, State, or Local Crime Laboratories or Offices will be publicized in *Microgram Bulletin*.** Exceptions may be requested and will be considered on a case-by-case basis. Employment Opportunity announcements should include the Formal Title of the Organization, Formal Title of the Laboratory or Office, Position Title, Laboratory or Office Location (City and State), Salary Range, Opening and Closing Dates, Duties, General Requirements, Specialized Requirements (if any), Application Procedures, and the Contact Individual's Name, Phone Number, email Address, and Mailing Address. If available, the URL for the agency's website, and (if available) the specific URL for the job posting should also be included in the Announcement. Employment Opportunities will be posted for a maximum of 3 consecutive months, but not past the application deadline.

#### **The Journal/Textbook Collection Exchange**

If any subscriber is interested in donating any forensic or analytical chemistry journal and/or textbook collection to a fellow subscriber or library, *Microgram Bulletin* is willing to list the offered materials and the associated contact information in a future issue (currently January, April, July, and October). The general format should follow the example in the January 2003 issue, and should be sent via email to the *Microgram* Editor at: [microgram\\_editor@mailsnare.net](mailto:microgram_editor@mailsnare.net) Only items for donation (not for sale) will be considered for publication, and donations to libraries should adhere to journal restrictions and/or time limits (if any) on such offers.

#### **Requests for *Microgram* and/or *Microgram Bulletin* Archives, 1967 - 2002**

All issues of *Microgram* (November 1967 - March 2002) and the first nine issues of its successor *Microgram Bulletin* (April - December, 2002) were and continue to be **Law Enforcement Restricted** publications, and are therefore (permanently) unavailable to the general public. [Note that this restriction includes requests made under the Freedom of Information (FOI) Act.]

Past issues or individual sections of issues (e.g., specific articles) are available to law enforcement affiliated offices and laboratories. Requests from such offices and laboratories **must be made on official letterhead** and mailed to:

Deputy Assistant Administrator  
Office of Forensic Sciences  
Drug Enforcement Administration  
2401 Jefferson Davis Highway  
Alexandria, VA 22301

Note that requests made via email will not be honored.



## DISCLAIMERS

1) All material published in either *Microgram Bulletin* is reviewed prior to publication. However, **the reliability and accuracy of all published information are the responsibility of the respective contributors, and publication in *Microgram Bulletin* implies no endorsement by the United States Department of Justice or the Drug Enforcement Administration.**

2) Due to the ease of scanning, copying, electronic manipulation, and/or reprinting, **only the posted copies of *Microgram Bulletin* (on [www.dea.gov](http://www.dea.gov)) are absolutely valid.** All other copies, whether electronic or hard, are necessarily suspect unless verified against the posted versions.

3) **WARNING!:** Due to the often lengthy time delays between the actual dates of seizures and their subsequent reporting in *Microgram Bulletin*, and also because of the often wide variety of seizure types with superficially similar physical attributes, published material cannot be utilized to visually identify controlled substances currently circulating in clandestine markets. **The United States Department of Justice and the Drug Enforcement Administration assume no liability for the use or misuse of the information published in *Microgram Bulletin*.**

# Microgram

## *Bulletin*

**Published by:**

**The Drug Enforcement Administration  
Office of Forensic Sciences  
Washington, DC 20537**

The U.S. Attorney General has determined that the publication of this periodical is necessary in the transaction of the public business required by the Department of Justice. Information, instructions, and disclaimers are published in the January issues.

**VOL. XXXVIII, NO. 2**

**FEBRUARY 2005**

**- INTELLIGENCE ALERT -**

**HEROIN CONCEALED WITHIN THE HOLLOWED OUT WOODEN SLATS  
OF A FRAME BOX IN DOVER, NEW JERSEY**

The DEA Northeast Laboratory (New York, New York) recently received a small wooden crate (15 x 12 x 10.5 inches) made of hollowed out boards containing a brown powder, suspected heroin (see Photo 1, right, and Photo 2, next page (displayed oversize to show detail)). The box originated in Brazil, was seized at a mail screening center in Dover, New Jersey by Immigration and Customs Enforcement Agents, and had originally contained porcelain pottery. The cavities in the individual slats were masked by strips of wood veneer, and were detected by X-ray analysis. Analysis of the powder (total net mass



**Photo 1**



**Photo 2**

485.9 grams) by GC/FID, GC/MS, and FTIR confirmed 75 percent heroin hydrochloride, adulterated with lidocaine. The Northeast Laboratory routinely encounters heroin concealed in a wide variety of items, including hollowed out boards (though never before as a crate).

\* \* \* \* \*

**- INTELLIGENCE ALERT -**

**“MELTED” COCAINE BRICKS WITH LETTER/BRAILLE LOGOS  
IN LOS ANGELES, CALIFORNIA**

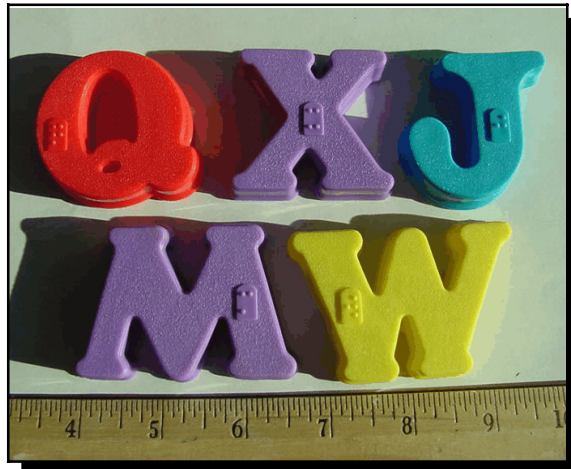
The DEA Southwest Laboratory (Vista, California) recently received 15 kilo bricks of suspected cocaine hydrochloride with non-standard consistency and also imprinted with unusual “M” and “W” letter logos containing tiny Braille characters for those letters (see Photo 3, right, and Photo 4, next page). The bricks were seized in the Los Angeles area by Agents from the DEA Los Angeles Division, and were wrapped in plastic and then a reddish-brown colored tape. Oddly, the bricks had a melted appearance as if they had been poured as a liquid slurry into the molds, as opposed to the usual damp pressings; however, they were not crumbly, and each one (still) weighed one kilogram and had about the same dimensions as standard pressed bricks. Analysis by GC, GC/MS, and FTIR



**Photo 3**



**Photo 4**



**Photo 5**

confirmed 71 percent cocaine hydrochloride adulterated with procaine hydrochloride and cut with lactose. The logos were made using small educational refrigerator magnets that can be purchased (as a complete alphabet set) at many toy stores (for examples, see Photo 5). This was the first submission of cocaine bricks either with a melted appearance or having letter/Braille logos to the Southwest Laboratory.

\* \* \* \* \*

### **- INTELLIGENCE ALERT -**

### **COCAINE IN INCA PLAQUES FROM GUATEMALA IN MIAMI**

The DEA Southeast Laboratory (Miami, Florida) recently received six “relief” plaques with Inca-style designs, each containing a hollowed out cavity containing packages of white powder, which field-tested positive for cocaine (see Photo 6). The plaques originated in Guatemala, and were seized from cargo at the Miami International Airport by Immigration and Customs Enforcement (ICE) Agents. Each plaque felt like hard plastic (not further identified), weighed about five pounds, and was backed with a narrow wooden board which was held in place with staples and/or a hard glue. The packages behind the boards were wrapped in clear plastic and aluminum foil. Analysis of the powder (total net mass 10,029 grams) by GC/MS and FTIR confirmed cocaine hydrochloride, ranging from approximately 75 to 80 percent purity. There have been several similar submissions to the Southeast Laboratory over the past few years.



**Photo 6**



**- INTELLIGENCE ALERT -**

**MARIJUANA CONCEALED IN CASKETS IN OKLAHOMA**

[From the NDIC *Narcotics Digest Weekly* 2005;4(3):3  
Unclassified, Reprinted with Permission.]

On December 10, 2004, an Oklahoma Highway Patrol (OHP) trooper stopped the driver of a box van for speeding and subsequently seized 610 pounds of marijuana. The two men in the van were traveling eastbound on Interstate 40. The driver, who appeared to be extremely nervous, produced registration and proof of insurance. When questioned, he stated that his trip had begun in Tucson, Arizona, and that he and his passenger were traveling to Atlanta, Georgia. The driver was issued a warning for speeding. The OHP trooper then asked for and was given consent to search the vehicle. A drug-detection canine alerted to the rear of the van. When officers opened the van doors they found numerous caskets, four of which contained 40 plastic-wrapped bundles of marijuana weighing a total of 610 pounds. Both the driver and passenger were taken into custody, and the vehicle was impounded.

NDIC Comment: Interstate 40 is one of the most common routes used by drug traffickers to transport illicit drugs in the United States. Law enforcement officers in Oklahoma commonly seize marijuana shipments from vehicles traveling on I-40. Because drug traffickers realize that they risk having their shipments seized when they travel on I-40, they are constantly developing new methods of concealment. This incident is the first in which law enforcement in Oklahoma reports seizing drugs from caskets.

\* \* \* \* \*

**- INTELLIGENCE ALERT -**

**TRAFFICKERS USE TRUCKS RESEMBLING NEW MEXICO DEPARTMENT  
OF TRANSPORTATION VEHICLES TO TRANSPORT MARIJUANA**

[From the NDIC *Narcotics Digest Weekly* 2005;4(3):2  
Unclassified, Reprinted with Permission;  
Some Details Withheld in Accordance with *Microgram* Policy.]

For the second time in 4 months, U.S. Customs and Border Protection (CBP) agents seized a truck resembling a New Mexico Department of Transportation (NMDOT) vehicle transporting marijuana. On November 30, 2004, CBP agents assigned to the Deming Station discovered over 2,312 pounds of marijuana in a truck resembling an NMDOT vehicle during a highway interdiction. Agents observed an orange utility truck traveling west on State Route 9 and later north on SR 11 from Columbus. An NMDOT emblem was present on both doors of the truck, and an amber-colored emergency light was mounted on the roof. The truck was also bearing a New Mexico government license plate. However, [certain aspects of the truck] were not consistent with official NMDOT vehicles. Agents stopped the utility truck to verify the immigration status of the driver. They subsequently searched the vehicle and discovered 245

bundles and 36 cardboard boxes of marijuana concealed in the bed and toolbox of the truck. Prior to this incident an NMDOT employee was arrested in September at a CBP checkpoint north of Las Cruces after agents discovered 293 pounds of marijuana in the truck he was driving. The subject had changed the appearance of his privately owned vehicle to resemble an NMDOT vehicle. He switched his personal license plate with a New Mexico government plate, affixed NMDOT emblems on the doors, and mounted emergency equipment to the roof. In both cases the subjects were turned over to Drug Enforcement Administration (DEA) agents on charges of possession with the intent to distribute drugs.

NDIC Comment: Drug traffickers in New Mexico and in other states along the Southwest Border occasionally steal delivery trucks or buy them at auctions and alter the appearance of the vehicles in an attempt to lessen the risk of being stopped by law enforcement officers during the transport of illicit drugs. They often paint companies' or government agencies' decals on the vehicles to make them appear to be legitimate. CBP agents in Arizona have encountered vehicles manipulated to resemble those in the CBP fleet. Those vehicles were equipped with the identical emergency equipment, decals and emblems, vehicle numbers, and government license plates used on official CBP vehicles.

\* \* \* \* \*

#### **- INTELLIGENCE ALERT -**

#### **4-METHYLAMINOREX/MDMA/METHAMPHETAMINE LABORATORY IN FORT LAUDERDALE**

[From the NDIC *Narcotics Digest Weekly* 2005;4(4):1  
Unclassified, Reprinted with Permission.]

On December 2, 2004, Fort Lauderdale Police officers and Drug Enforcement Administration (DEA) agents responding to an anonymous tip seized an operational laboratory used to make three illegal drugs - 4-methylaminorex (also known as U4Euh, euphoria, and intellex), MDMA (3,4-methylenedioxymethamphetamine, also known as ecstasy), and crystal methamphetamine (also known as ice). Officers seized 5 pounds of 4-methylaminorex that had been stored in a freezer and hundreds of bottles of chemicals that had been stored in the man's home and a nearby storage unit. Law enforcement officers arrested the laboratory operator, a 46-year-old Caucasian male with a degree in chemical engineering who had no prior criminal history and was a Broward County Environmental Protection Department employee. The man had established a fraudulent chemical company that enabled him to order many chemicals from wholesale suppliers and have them shipped directly to his home. He also reportedly stole chemicals from his workplace. Law enforcement officials believe that the laboratory operator had been producing the drugs in his home since June 2004. The man was charged in federal court with numerous crimes including conspiracy to manufacture 4-methylaminorex, MDMA, and methamphetamine. Law enforcement officials report that the defendant, who is gay, marketed the 4-methylaminorex to gay men in South Florida who abused other drugs including crystal methamphetamine. In addition to distributing the drug locally, the man is believed to have sold wholesale quantities to associates in California and Australia.



NDIC Comment: According to drug abuse researchers, gay men who abuse methamphetamine typically do so to achieve sexual enhancement, an effect they may try to replicate with other stimulant drugs such as 4-methylaminorex. The drug 4-methylaminorex has been a Schedule I controlled substance under the Controlled Substances Act since 1987 but has rarely been seized by law enforcement in the United States, and its abuse has never been widespread in the country. As a result of the publicity surrounding this event, other illicit drug producers with some chemical background may try to produce and distribute 4-methylaminorex. A synthetic stimulant, 4-methylaminorex is similar to methamphetamine in that it is available in either powdered or crystal form and can be ingested, injected, snorted, or smoked. Many abusers of 4-methylaminorex report that its stimulant effects are longer lasting than those of methamphetamine.

\* \* \* \* \*

### **- INTELLIGENCE BRIEF -**

#### **LARGE SEIZURE OF APPARENT “ICE” METHAMPHETAMINE IN BECKHAM COUNTY, OKLAHOMA**

The Oklahoma State Bureau of Investigation’s Central Drug Lab (Oklahoma City, Oklahoma) recently received nine plastic containers containing a crystal-like substance, suspected “Ice” methamphetamine (see Photos 7 and 8). The exhibits were seized by a state Drug Task Force from an eastbound SUV-type vehicle during a highway interdiction stop on Interstate 40 in Beckham County (western Oklahoma). The containers were all the same size, were individually wrapped in plastic, and were hidden in a false compartment in the rear of the vehicle. The lids of the containers were marked with “O.K.” in red marker. Analysis of the material (total net mass approximately 15.3 pounds) by GC and GC/MS confirmed methamphetamine. HPLC quantitation on two exhibits indicated 76 and 75 percent methamphetamine, calculated as the hydrochloride salt (the remaining samples were not quantitated). Although not a record, this was a large submission to the laboratory [Editorial Notes, next page].



**Photo 7**



**Photo 8**

[Editor's Notes: Per the Federal Sentencing Guidelines, "Ice" is 80 percent or greater *d*-methamphetamine hydrochloride. The definition does not include any language concerning physical appearance. The above exhibits meet the generally accepted *descriptive* understanding of "Ice" (that is, large crystals of methamphetamine hydrochloride), but not the legal definition.]

\* \* \* \* \*

## **- INTELLIGENCE BRIEF -**

### **DIMETHYLAMPHETAMINE IN "ICE"-LIKE FORM IN FLORENCE, ALABAMA**

The South Central Laboratory (Dallas, Texas) recently received a large, multiple exhibit submission of powdered and crystalline substances, suspected crystal and "Ice" methamphetamine (see Photos 9 and 10 for some of the "Ice" appearing samples). The exhibits were seized at three residences in Florence, Alabama by Task Force Agents from the DEA Huntsville, Alabama Post of Duty (Florence is located in the far northwest corner of the state). Analysis by GC/MS, FTIR, and HPLC, however, indicated eight exhibits containing methamphetamine, seven exhibits containing dimethylamphetamine, one exhibit containing a mixture of methamphetamine and dimethylamphetamine, seven exhibits containing cocaine, and three exhibits containing only dimethylsulfone (DMS). Most of the exhibits containing methamphetamine or dimethylamphetamine also contained DMS as a cutting agent. The dimethylamphetamine samples ranged in concentration from 18 to 99 percent, and five were cut with DMS. Three of the dimethylamphetamine samples looked like "Ice", while the other four were powders. The methamphetamine/dimethylamphetamine sample was grey crystals, and was cut with DMS. The South Central Laboratory has previously encountered dimethylamphetamine as a minor component in methamphetamine exhibits, but not as the principal or sole component.



**Photo 9**



**Photo 10**

**- INTELLIGENCE BRIEF -**

**PSEUDOEPHEDRINE CONTROLS IMPLEMENTED IN ILLINOIS**

[From the NDIC *Narcotics Digest Weekly* 2005;4(4):3  
Unclassified, Reprinted with Permission.]

On January 1, 2005, the Methamphetamine Manufacturing Chemical Retail Sale Control Act (720 ILCS 647) went into effect [in Illinois]. The act regulates the packaging, display, and sale of pseudoephedrine, a precursor commonly used in the production of methamphetamine. Manufacturers of products that contain pseudoephedrine must limit the amount of the drug contained in each blister pack box to no more than 3 grams. Store owners in Illinois must place adult-strength cold tablets that contain pseudoephedrine as their sole active ingredient behind store counters or in locked cases. Additionally, retailers may not sell more than two packages at a time of a product containing pseudoephedrine.

NDIC Comment: A growing number of lawmakers in midwestern and western states are battling the increasing methamphetamine production threat by passing laws that control the packaging, retail display, and sale of pseudoephedrine. For example, Indiana is considering a new law similar to that passed in Illinois, while Iowa and Missouri are considering strengthening existing laws. Some legislators are considering a law that would list pseudoephedrine products as Schedule V narcotics under the Controlled Substances Act. However, until lawmakers in all U.S. states adopt legislation controlling the sale of pseudoephedrine, it is likely that methamphetamine producers will obtain pseudoephedrine in states where restrictions are not yet in place. For instance, when Oklahoma lawmakers enacted a stringent pseudoephedrine law in April 2004, law enforcement officials in neighboring states reported an increase in pseudoephedrine sales.

\* \* \* \* \*

**Selected Intelligence Brief**

**METHAMPHETAMINE MYTHS**

[From the NDIC *Narcotics Digest Weekly* 2005;4(2):1  
Unclassified, Reprinted with Permission.]

**FACT OR FICTION?**

- \* Methamphetamine can be produced in a fish tank using gun bluing and charcoal.
- \* Pseudoephedrine can be obtained from chicken feed and mineral blocks.
- \* Red phosphorus can be obtained from old television tubes.
- \* A chemical in a tire repair product can be used in place of anhydrous ammonia.

These are among the many stories that law enforcement officers and first responders hear every year. How many of these commonly circulated beliefs are based on fact? How many are pure fiction?

## Background

Methamphetamine myths have circulated in the intriguing subculture of methamphetamine producers and abusers since the early 1990s. Chronic methamphetamine abusers--commonly known as tweakers--are the driving force behind the most common methamphetamine myths. Many methamphetamine abusers, including tweakers, also produce methamphetamine for personal use; they sometimes produce enough to sell to finance their next production cycle.

### **Tweaking**

Chronic methamphetamine abuse produces a psychosis similar to schizophrenia and is characterized by paranoia, mutilation of the skin, self-absorption, and auditory and visual hallucinations. Additionally, chronic methamphetamine abusers frequently behave in a violent and erratic manner, particularly when they ingest high doses of the drug. These abusers often binge on methamphetamine, during which time they do not eat and, therefore, lose a significant amount of weight. Quite often they completely ignore personal hygiene.

The most dangerous stage of the binge cycle is known as tweaking. During the tweaking stage, the tweaker has not slept in days, becomes paranoid, and has an intense craving for more methamphetamine. No amount of methamphetamine will recreate the euphoric high initially achieved, which causes frustration for the tweaker and leads to unpredictable and potentially violent behavior. Tweakers also become captivated by the most insignificant objects or details. For example, they will disassemble small kitchen appliances or electronic equipment and scatter parts all over the room. The bizarre methamphetamine myths that law enforcement officers and first responders often hear during methamphetamine-related investigations are most likely concocted and tested by tweakers during the tweaking stage.

Methamphetamine abusers typically produce methamphetamine using the red phosphorus or lithium/ammonia (also known as Nazi or Birch) production method. The precursor chemicals used in the red phosphorus method are pseudoephedrine, iodine, and red phosphorus. The precursors used in the lithium/ammonia method are pseudoephedrine, lithium metal, and anhydrous ammonia. Methamphetamine myths often involve methods of obtaining precursors, such as extracting chemicals from common retail items, as well as methods of producing methamphetamine using ordinary products as precursors. Some methamphetamine abusers may be trying to contend with practical issues--such as faster and cheaper ways to manufacture the drug--when they stumble upon what they believe to be a new method of production or an easier way to obtain a precursor. Consequently, abusers attempting to manufacture methamphetamine often are the source of unfounded information concerning methamphetamine production.

## Fact or Fiction?

Law enforcement officers and first responders have reported dozens of methamphetamine myths over the past 15 years. Most have proven to be pure fiction, although some that they have encountered while interacting with small-scale methamphetamine producers have factual basis. Most of the myths involve extracting precursor chemicals--primarily ephedrine, pseudoephedrine, or red phosphorus--from common retail products or using household products as precursors in the production process. The following two tables exhibit many of the most popular myths reported over the past 5 years as well as simple reasons for the myths being fact or fiction.

**Table 1: Methamphetamine Myths Involving Precursor Chemicals**

Myth	Fact
Methamphetamine can be produced using <b>ALMOND OR VANILLA EXTRACT</b> .	Extracts cannot be used as precursors.
<b>ARGON GAS</b> can be used in place of anhydrous ammonia.	Argon gas was rumored to be useful in place of anhydrous ammonia; however, this myth was based on the fact that a company called "Airgas" manufactures a high-purity form of anhydrous ammonia called "ammonia blue."
<b>CARPENTER'S CHALK</b> contains red phosphorus that can be used in the red phosphorus production method.	Commercial red carpenter's chalk closely resembles red phosphorus but cannot be used in place of red phosphorus.
Manufacturers of <b>CHICKEN FEED</b> add ephedrine or pseudoephedrine to the feed, and the chemicals can be extracted and used in methamphetamine production.	Ephedrine or pseudoephedrine has never been added to chicken feed.
<b>CREATINE</b> can be used to produce methamphetamine.	Creatine is a dietary supplement and is not useful in methamphetamine production. Creatine has been used as

	a diluent for methamphetamine, cocaine, and ketamine.
Methamphetamine can be produced in a <b>FISH TANK</b> using <b>CHARCOAL</b> and <b>GUN BLUING</b> , among other items.	None of these items contain precursors necessary for methamphetamine production.
Methamphetamine can be produced by passing an <b>ELECTRIC CURRENT</b> through an <b>ALUMINUM SCREEN</b> sprayed with <b>FOAM INSECTICIDE</b> .	The resulting compound does not contain methamphetamine, but some methamphetamine abusers reportedly have used the substance as a cutting agent (diluent) for methamphetamine. Insecticide is toxic when ingested, injected, or inhaled by humans.
One of the chemicals in <b>FIX-A-FLAT</b> tire repair can be used in place of anhydrous ammonia to produce methamphetamine.	Some tire repair products contain a minute amount of ammonia, but it cannot be separated from the solvents.
<b>HALON</b> from halon fire extinguishers can be used in place of anhydrous ammonia in methamphetamine production.	Halon fire extinguishers contain no chemicals that can be used in place of anhydrous ammonia. Lab operators often use empty fire extinguisher canisters to contain anhydrous ammonia stolen from storage tanks.
<b>HOUSEHOLD AMMONIA</b> can be used in place of anhydrous ammonia.	Household ammonia contains too much water to be used in methamphetamine production.
Anhydrous ammonia can be obtained by freezing <b>HOUSEHOLD AMMONIA</b> .	Water cannot be frozen out of ammonia in a household freezer.
<b>HYDROCHLOROTHIAZIDE</b> can be used in methamphetamine production.	Hydrochlorothiazide is a commonly prescribed blood pressure medication that cannot be used to produce methamphetamine.
<b>JEWELER'S ROUGE</b> can be used in	Jeweler's rouge does not contain red



place of red phosphorus.	phosphorus, although it is similar in appearance.
Ephedrine or pseudoephedrine can be extracted from <b>MINERAL BLOCKS</b> such as <b>SALT LICKS</b> .	Mineral blocks including salt licks do not contain ephedrine or pseudoephedrine; however, salt can be extracted from salt licks and used in methamphetamine production.
Crystal methamphetamine can be made using <b>PEPTO-BISMOL®</b> .	There are no chemicals in Pepto-Bismol® that are useful in methamphetamine production.
Red phosphorus can be extracted from incendiary <b>SHOTGUN SHELLS</b> , particularly Dragon's Breath shells.	Dragon's Breath shells are constructed with a propellant charge and particles of zirconium metal. Shotgun shells typically contain no red phosphorus.
Ammonia can be extracted from <b>SMELLING SALTS</b> .	The quantity of ammonia in smelling salts is minute, and the product would be no more useful in methamphetamine production than trying to use household ammonia.
Red phosphorus can be obtained from the heads of " <b>STRIKE ANYWHERE</b> " MATCHES.	"Strike Anywhere" match heads contain phosphorus sulphide, oxidizing agents, powdered glass, and glue. Red phosphorus cannot be extracted from the matchheads.
Red phosphorus can be obtained from old <b>TELEVISIONS</b> , particularly from TV tubes.	Television manufacturers report that no red phosphorus is used in televisions; only rare earth phosphor is used in the tubes.

**Table 2: Miscellaneous Myths**

<b>Myth</b>	<b>Fact</b>
<b>COLORED</b> methamphetamine, such as black or purple, has some significance.	Some producers add coloring to their methamphetamine to give it a "signature" that tells abusers who produced the drug. Colors also remain in methamphetamine from the pseudoephedrine tablets (red) and sodium hydroxide (blue drain cleaner) used in the production process.
<b>DIABETES TEST STRIPS</b> are used in methamphetamine production.	Test strips used with blood glucose monitors often are stolen from pharmacies or are obtained via health insurance fraud and are resold on Internet auction sites, at flea markets, and at convenience stores. There is no use for such items in the production of methamphetamine.
<b>GEL METHAMPHETAMINE</b> , which resembles petroleum jelly, can be rubbed directly on the skin and absorbed through the pores.	This myth began when an arrestee thought he/she heard officers report that they had encountered methamphetamine resembling petroleum jelly.
<b>INFANT FORMULA</b> is used as a cutting agent (diluent) for drugs such as methamphetamine.	Infant formula often is stolen from retail stores and resold on Internet auction sites, at flea markets, and at convenience stores. Some criminal groups steal large quantities of infant formula and smuggle the formula to other locations--particularly Mexico and Central America--where the formula is sold on the black market. Infant formula is not a common diluent for methamphetamine.

## Summary

Methamphetamine myths will continue to circulate as long as methamphetamine abusers seek faster and cheaper ways to manufacture the drug. The nationwide tweaker subculture allows myths to spread rapidly. It is quite common for law enforcement officers and first responders throughout the United States to report hearing an unusual story about a new methamphetamine production method, a shortcut used in the production process, or an alternative to a common precursor. However, as officers and first responders become more aware of the effects of methamphetamine abuse and particularly the intricacies of tweekers, they will recognize methamphetamine myths for what they are--the drug culture's version of the urban legend.

\* \* \* \* \*

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[Notes: Selected references are a compilation of recent publications of presumed interest to forensic chemists. Unless otherwise stated, all listed citations are published in English. Listed mailing address information (which is sometimes cryptic or incomplete) exactly duplicates that provided by the abstracting services. Patents are reported only by their *Chemical Abstracts* citation number.]

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4. Brandt SD, Freeman S, McGagh P, Abdul-Halim N, Alder JF. **An analytical perspective on favoured synthetic routes to the psychoactive tryptamines.** Journal of Pharmaceutical and Biomedical Analysis 2004;36(4):675. [Editor's Notes: Appears to be a review of the topic, focusing on the probable impurities and marker compounds resulting from common illicit syntheses. Contact: Department of Instrumentation and Analytical Science, UMIST, Institute of Science and Technology, P.O. Box 88, Manchester M60 1QD, U.K.]
5. Day JS, Edwards HGM, Dobrowski SA, Voice AM. **The detection of drugs of abuse in fingerprints using Raman spectroscopy II: Cyanoacrylate-fumed fingerprints.** Spectrochimica Acta 2004;60:1725. [Editor's Notes: Includes analyses of codeine, cocaine, amphetamine, barbitol, nitrazepam, and five common adulterants. Contact: Chemical and Forensic Sciences, University of Bradford, Bradford, West Yorkshire, BD7 1DP, UK.]

6. Fitsev IM, Blokhin VK, Budnikov GK. **Chromatographic techniques in forensic chemical examinations.** Journal of Analytical Chemistry (Translation of *Zhurnal Analiticheskoi Khimii*) 2004;59(12):1171. [Editor's Notes: A minor review. (Unspecified) psychoactive drugs are discussed. Contact: Forensic Examination Center, Ministry of Internal Affairs of Tatarstan, ul. Dzerzhinskogo 19, Kazan, Tatarstan 420503, Russia.]
  
7. Wilson JM, McGeorge F, Smolinske S, Meatherall R. **A "Foxy" intoxication.** Forensic Science International 2005;148(1):31. [Editor's Notes: Focus is toxicological, but includes mass spectra for the title compound (N,N-diisopropyl-5-methoxytryptamine, also known as "Foxy-Methoxy") and N,N-diisopropyl-5-hydroxytryptamine. Note that there are some nomenclature problems in this article, and the structure and term 5-ethoxy-diisopropyltryptamine are incorrectly used in several instances. Contact: Laboratory Medicine, St. Boniface General Hospital, 409 Tache Avenue, Winnipeg Manitoba, Canada R2H 2A6.]
  
8. Zhang ZY, Yang JH, Ouyang H, Li ZJ, Chai ZF, Zhu J, Zhao JZ, Yu ZS, Wang J. **Study of trace impurities in heroin by neutron activation analysis.** Journal of Radioanalytical and Nuclear Chemistry 2004;262(1):295. [Editor's Notes: 62 heroin samples were analyzed for 15 trace elements by NAA. The authors indicate that the results provide origin information. Contact: Institute of High Energy Physics, Key Laboratory of Nuclear Analytical Techniques, The Chinese Academy of Sciences, Beijing, Peop. Rep. China 100039.]

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## NEW EMAIL ADDRESSES NEEDED

The email addresses for the following organizations have returned rejection notices to the *Microgram* Editor for the past three email notifications of *Microgram Bulletin*, and will therefore be dropped from the subscription list unless a corrected email address is provided by March 31, 2005. Note that the errors include anti-spamming, mailbox full, user not found, or user unknown messages. The Editor requests your assistance in contacting these organizations, determining if they wish to remain on the *Microgram* subscription e-net, and if so asking them to provide a valid email address to the Editor at: [microgram\\_editor-at-mailsnare.net](mailto:microgram_editor-at-mailsnare.net)

Aiken County Sheriff's Office, Aiken, SC

Alabama Department of Forensic Sciences - Birmingham, Dothan, and Huntsville Laboratories

Caroline County Sheriff's Department, Denton, MD

Connecticut Department of Public Safety, Division of Scientific Services, Meriden, CT

Georgia Bureau of Investigation, Central Region Medical Examiner's Office, Dry Branch, GA

G.J. Kupferschmidt Consulting, Ontario, Canada

Glendale Police Department, Special Investigations Unit, Glendale, AZ

Kaiser-Permanente Regional Laboratory, Portland, OR

Kentucky State Police - All Laboratories (ISP appears to have changed)

Laboratory for Clinical and Forensic Toxicology, Antwerp, Belgium

Morris County Sheriff's Crime Laboratory, Morristown, NJ

National Bureau of Investigation, Vantaa, Finland  
New South Wales Police, Forensic Services, New South Wales, Australia  
Newark Police Department, Forensic Laboratory, Newark, NJ  
Office of the Deputy Assistant Secretary of Defense for Counternarcotics, Washington, DC  
Oklahoma City Police Department, Forensic Drug Laboratory, Oklahoma City, OK  
Sheridan Police Department, Sheridan, CO  
University of New Haven, Forensic Sciences Program, West Haven, CT  
U.S. SOUTHCOM (Herndon, VA Office (Counternarcotics))  
USACIL, Hickam AFB, HI  
Washington State Patrol - All Laboratories (ISP appears to have changed)

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## **THE DEA FY - 2005 STATE AND LOCAL FORENSIC CHEMISTS SEMINAR SCHEDULE**

The remaining FY - 2005 schedule for the DEA's State and Local Forensic Chemists Seminar is as follows:

May 9 - 13, 2005  
July 11 - 15, 2005  
September 19 - 23, 2005

Note that the school is open only to forensic chemists working for law enforcement agencies, and is intended for chemists who have completed their agency's internal training program and have also been working on the bench for at least one year. There is no tuition charge for this course. The course is held at the AmeriSuites Hotel in Sterling, Virginia (near the Washington/Dulles International Airport). A copy of the application form is reproduced on the last page of the August 2004 issue of *Microgram Bulletin*. Completed applications should be mailed to the Special Testing and Research Laboratory (Attention: Pam Smith or Jennifer Kerlavage) at: 22624 Dulles Summit Court, Dulles, VA 20166. For additional information, call 703/668-3337.

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# Computer Corner

## Digital Evidence Inventory Theory

# #191

by Michael J. Phelan  
DEA Digital Evidence  
Laboratory

Evidence inventory is a critical component of every forensic laboratory operation. Digital laboratories' evidence inventories are inherently complex tasks because of the unusual types of evidence that must be secured and tracked. For example, a computer hard drive evidence submission could contain copies of multiple exhibits made on-site, while another hard drive evidence submission might contain only part of a much larger exhibit. A Redundant Array of Inexpensive Drive (RAID) configuration could have up to 10 hard drives that make up only one logical drive. Careful labeling and tracking of these varied evidence submissions is important to avoid confusion during inventories.

Yet another digital evidence inventory consideration is the need for a laboratory to simultaneously account for original, archival, and work copy evidence, in order to meet chain of custody requirements. Development of clear definitions of each evidence category, and the corresponding policies regarding evidence labeling, inventorying, handling, and destruction, are essential.

### Basic Concepts

There are five basic concepts when considering digital evidence inventories. The first

concept is the definition of digital evidence - not a simple matter! The Scientific Working Group on Digital Evidence (SWGDE) has defined digital evidence as information of potential probative value that is either stored or transmitted in binary form. This definition is widely interpreted as meaning the binary data, as represented by either a magnetic flux or optical reflectivity pattern (and its associated *meta* data such as format, access rights, and date/time stamp information) stored on the physical object (typically a hard drive, diskette, CD/DVD, magnetic tape, or memory chip). A common point of misinterpretation arises when the object itself (the container) is confused with the actual binary data. For example, when on-site copies of evidence are placed onto a law enforcement hard drive (or drives) for temporary transport or storage, the data is the evidence - not the hard drive(s).

The second concept is more familiar - the requirement to continuously account for all digital evidence exhibits and subexhibits. Again, however, the definitions are important. For example, a computer containing two hard drives may require (if the seizing official determines) two separate exhibit number assignments, one for each hard drive, as opposed to a

single number for the computer itself. Subexhibits may need to be recognized at the same time. For example, a seized computer might have a CD/DVD drive that contains a CD - that CD merits recognition as a sub-exhibit, since it is physically associated with the hosting computer. Similar considerations apply to any other form of portable storage that is associated with a seized computer.

The third concept is evidence containers. As noted above, the container may or may not be the actual evidence. Nonetheless, containers must be uniquely identified, secured, and tracked to maintain their accountability. Documentation of contents is also critical - a container may be documented to contain: 1) only one exhibit; 2) more than one exhibit; or 3) part of one exhibit (for example a RAID drive).

The fourth concept is the definition and differentiation of "original" versus "best evidence" submissions. This is important because the former may be required to be returned to the submitting agent or even the original owner at some future date.

Finally, the fifth concept is the definition and differentiation of "work" versus "archive" copies. Work copies must be carefully controlled, since all derivative



findings are based on its examination. However, archive copies are equally important, because they may be needed at a later date to answer requests for defense discovery, or to serve as the basis of a supplemental examination if such is ever requested by the investigator or Court.

### **Working Definitions**

*Original Evidence* is the actual seized or surrendered object.

*Work Copy Evidence* is a forensically produced replica that may be either a complete, exact copy (often referred to as a duplicate, sector-by-sector copy, physical copy, or a "bit stream image"), or a simple copy (often referred to as a file, directory, partition, logical copy, or remapped copy). Both work copy products are accurate representations of the original (usually validated by comparing the original and work copy hash values). Work copy evidence is usually considered temporary, and is typically destroyed/wiped at the conclusion of the examination.

*Archive Evidence* is a more permanent storage that should reliably store a copy of the evidence for as long as the investigative agency requires. Different organizations can have very different retention policies. Some digital laboratories return the archive copy to the submitting investigator upon completion of the examination. Other organizations maintain a central archive. However, the importance of maintaining an archive copy under seal, and recorded in a system of records,

is essential to its potential acceptance in the future by the courts as "best evidence".

### **Digital Inventory Strategies**

Most forensic laboratories have some form of redundancy in their laboratory evidence management systems. This redundancy is often the result of older systems being replicated (but not replaced) by newer, more capable systems - for example, a paper system by an electronic system. Although the electronic system was often originally instituted as a "replacement" for the paper system, laboratory management usually prefers to have a duplication of the records because of the critical importance of evidence accountability. All systems are prone to some level of failure because of human operator error. Retaining redundancy is therefore prudent, especially given the negative consequences of losing track of evidence. There is a (rational) assumption that the chance of the same error occurring in two unrelated systems is significantly lower versus in a single, non-redundant system.

A complementary quality control system is essential to evidence inventory management. The essence of quality control for an evidence inventory system is a robust audit program, typically involving monthly checks along with formally scheduled internal and external full evidence audits. On the latter point, while automated inventory technologies such as bar codes are an efficient means to track a large number of objects, reliance

upon bar code-based systems is no substitute for human checking of the information on the evidence label and seals.

### **Summary**

The ideal digital evidence inventory control system should be able to simultaneously track both exhibits and submitted objects. Digital containers and original evidence need to be differentiated in an inventory system. Archive evidence should have a simple one-to-one relationship between the archive container (usually a sealed evidence bag, envelope, or box) and the archive media contained within. There are two advantages to the one-to-one relationship: First, the archive inventories are straightforward; and second, discovery motions can be answered by copying the requested exhibit in the archive - and not by having to extract one exhibit from possibly many exhibits stored on a hard drive.

All transactions involving evidence custodians and examiners need to be documented. Establishing time limits for evidence checked out to examiners and the courts is a good means to maintaining control. Having too many exhibits assigned out to one examiner is an invitation for future problems.

Comments or Questions?  
E-mail: Michael.J.Phelan -at- usdoj.gov

# Microgram

## Bulletin

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The U.S. Attorney General has determined that the publication of this periodical is necessary in the transaction of the public business required by the Department of Justice. Information, instructions, and disclaimers are published in the January issues.

**VOL. XXXVIII, NO. 3**

**MARCH 2005**

**- INTELLIGENCE ALERT -**

**FRESH AND DRIED KHAT IN PHOENIX, ARIZONA**

The Phoenix Police Department Laboratory Services Bureau (Phoenix, Arizona) recently received two separate submissions of fresh and dried plant materials, suspected khat (*catha edulis*). The first consisted of eight bundles of plant stems and leaves approximately 9-10 inches in length (total net mass 510 grams) wrapped in a paper towel and banana leaf then tied with plant fibers (see Photo 1). The exhibit had been shipped from England directly to a Phoenix apartment via an express mail service (circumstances of seizure not available; not known (to the analyst) whether the sample was cooled in any manner for shipping). The second



**Photo 1 (Ruler is 6 inches long)**

submission consisted of one exhibit of fresh plant leaves (total net mass 250 grams, see Photo 2) and two exhibits of dried plant leaves “graba” (total net mass 790 grams, no photo). This latter submission was seized from the baggage of a passenger who flew from Ethiopia to Phoenix Sky Harbor Airport, and was not cooled. Since only cathine is controlled in Arizona, both submissions were frozen upon receipt in order to prevent the (natural) decomposition of cathinone to cathine. After acid/base workup and chloroform extraction, analysis by GC/MS showed the presence of both cathinone and cathine in all of the submissions (not quantitated), confirming that they were khat. These are the first submissions of khat seen by the laboratory in eight years, and the first ever submission of dried khat (“graba”).



**Photo 2 (Ruler is 6 inches long)**

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### **- INTELLIGENCE ALERT -**

### **ECSTASY MIMIC TABLETS CONTAINING 5-METHOXY-N-METHYL-N-ISOPROPYLTRYPTAMINE (5-MeO-MiPT) IN WASHINGTON, DC**

The DEA Mid-Atlantic Laboratory (Largo, Maryland) recently received a submission of 20 off-white tablets with cherry logos, diameter approximately 8 millimeters, suspected Ecstasy (see Photo 3; note that the color of the tablets is affected by the background - the actual color is off-white). The exhibit was seized by the U.S. Park Police in Washington, DC (circumstances of seizure not reported). Analysis of the tablets (total net mass 3.0 grams) by FT-IR, GC, and GC/MS, however, indicated not MDMA but rather N-isopropyl-5-methoxy-N-methyl-tryptamine (more usually named as 5-methoxy-N-methyl-N-isopropyltryptamine (5-MeO-MiPT); not quantitated). 5-MeO-MiPT is controlled (Schedule I) as an analogue of 5-methoxy-N,N-diisopropyltryptamine (5-MeO-DIPT, also known as “Foxy-Methoxy”). The Mid-Atlantic Laboratory has encountered other 5-methoxylated tryptamines, but this is the first ever submission of 5-MeO-MiPT.



**Photo 3**



**- INTELLIGENCE BRIEF -**

**OPIUM IN DETROIT, MICHIGAN**

The DEA North Central Laboratory (Chicago, Illinois) recently received a large rounded-rectangular mass of a dark brown, gummy/tacky solid (“Tootsie Roll” appearance and consistency), suspected opium (see Photos 4 and 5). The material (total net mass 1,985 grams) was packaged in layers of plastic wrap, a re-sealable plastic bag, and duct tape. The exhibit was seized by the U.S. Customs Service from an individual attempting to enter the United States from Canada at the Detroit, Michigan POE. Analyses by color tests, TLC, and GC/MS indicated morphine, codeine, thebaine, papaverine, meconin, hydrocotarnine, and noscapine, confirming opium (approximate relative ratios based on GC area counts: 100:50:30:25:15:8:7). The North Central Laboratory receives approximately five samples of opium a year; however, this was the largest amount of opium ever received as a single exhibit.



**Photo 4**



**Photo 5**

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**- INTELLIGENCE BRIEF -**

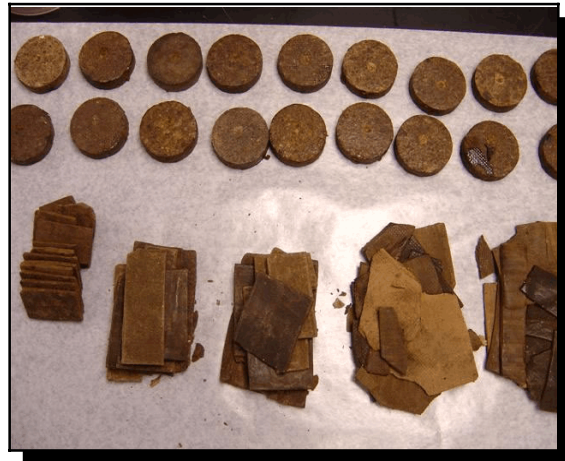
**VACUUM PACKED, COMPRESSED HASHISH IN LAURIER, WASHINGTON**

The DEA Western Laboratory (San Francisco, California) recently received an unusual submission of vacuum-packed, compressed pieces of brown material, suspected hashish. In all, the exhibit included 46 disk-shaped pieces with a diameter of approximately 5 centimeters and a thickness of 1 centimeter, 32 pieces of thin, various sized rectangular pieces, and 2 groups of rectangular pieces stuck together (see Photos 6 and 7, next page). The disks were vacuum-sealed in plastic bags, usually in groups of four, while the flat rectangular pieces were in separate, vacuum-sealed bags. The exhibit (total net mass 1,753 grams) was seized at the Laurier, Washington POE by the U.S. Border Patrol from three individuals who were carrying backpacks of marijuana (Laurier is on Interstate 395 in far northeastern Washington, on the border with

British Colombia, Canada). Analysis by Duquenois-Levine color testing, microscopic examination, TLC, and GC/MS identified THC and various other cannabinoids, confirming hashish (quantitation not reported). This was the first submission of hashish in these shapes to the Western Laboratory.



**Photo 6**



**Photo 7**

\* \* \* \* \*

### **- INTELLIGENCE BRIEF -**

### **COCAINE IN CANNED MILK CAN IN HUELVA, SPAIN**

The Estupeficientes Control Laboratory of the Health Department (Seville, Spain) recently received a submission of six food containers, one of which (canned milk) contained a pasty brownish powder, suspected cocaine (see Photo 8 (best available photo)). The exhibits were mailed from Colombia, and were seized in Huelva (southern Spain) by the Guardia Civil/Anti-Narcotics Enforcement Department. Analysis of the material (total net mass 228.32 grams) by color testing and GC/FID confirmed 31.8 percent cocaine hydrochloride. The other five food containers (labelled as cocoa powder, cocoa cream, and coffee) did not contain any controlled substances. This was the first known seizure of canned cocaine in the city of Huelva.



**Photo 8**

\* \* \* \* \*

## SELECTED REFERENCES

[Notes: Selected references are a compilation of recent publications of presumed interest to forensic chemists. Unless otherwise stated, all listed citations are published in English. Listed mailing address information (which is sometimes cryptic or incomplete) exactly duplicates that provided by the abstracting services. Patents are reported only by their *Chemical Abstracts* citation number.]

1. Anastos N, Lewis SW, Barnett NW, Pearson JR, Kirkbride KP. **The rapid analysis of heroin drug seizures using micellar electrokinetic chromatography with short-end injection.** *Journal of Forensic Sciences* 2005;50(1):37. [Editor's Notes: Presents the title study. Good separation of heroin and various adulterants and diluents was obtained. Contact: School of Biological and Chemical Sciences, Deakin University, Geelong, Victoria 3217, Australia.]
2. Del Signore AG, McGregor M, Cho BP. **<sup>1</sup>H NMR analysis of GHB and GBL: Further findings on the interconversion and a preliminary report on the analysis of GHB in serum and urine.** *Journal of Forensic Sciences* 2005;50(1):81. [Editor's Notes: Presents the title study. Spiked samples are included. Focus is toxicological, but the results are pertinent for spiked beverages. Contact: Department of Biomedical and Pharmaceutical Sciences, College of Pharmacy, University of Rhode Island, Kingston, RI 02881.]
3. Levine B, Editor. Various Topics. *Principles of Forensic Toxicology* (2nd Ed.). AACC Press, Washington, DC, 2003. [Editor's Notes: Includes reviews on Forensic Drug Testing, Spectrophotometry, Chromatography, Mass Spectrometry, Inhalants, and others. Focus is toxicological. No Contact Information.]
4. Li J, Ye L. **Determination of opioids.** *Zhongguo Yaowu Yilaixing Zazhi* 2004;13(3):235. [Editor's Notes: A minor overview, including discussions of the use of TLC, immunoassay, and GC/MS, for the title study. This article is written in Chinese. Contact: Teacher's College, Beijing Union University, Beijing 100011, Peop. Rep. China.]
5. Meyers JE, Almirall JR. **Analysis of gamma-hydroxybutyric acid (GHB) in spiked water and beverage samples using solid phase microextraction (SPME) on fiber derivatization/gas chromatography-mass spectrometry (GC/MS).** *Journal of Forensic Sciences* 2005;50(1):31. [Editor's Notes: Presents the title study. Contact: International Forensic Research Institute, Department of Chemistry, Florida International University, Miami, FL 33199.]
6. Person EC, Meyer JA, Vyvyan JR. **Structural determination of the principal byproduct of the lithium-ammonia reduction method of methamphetamine manufacture.** *Journal of Forensic Sciences* 2005;50(1):87. [Editor's Notes: Identifies the title byproduct (1-(1',4'-cyclohexadienyl)-2-methylaminopropane) via comprehensive spectral and chromatographic methodologies. Contact: Washington State Patrol, Marysville Crime Laboratory, 2700 116<sup>th</sup> Street NE, Suite P, Marysville, WA 98271.]
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## THE DEA FY - 2005 STATE AND LOCAL FORENSIC CHEMISTS SEMINAR SCHEDULE

The remaining FY - 2005 schedule for the DEA's State and Local Forensic Chemists Seminar is as follows:

May 9 - 13, 2005  
July 11 - 15, 2005  
September 19 - 23, 2005

Note that the school is open only to forensic chemists working for law enforcement agencies, and is intended for chemists who have completed their agency's internal training program and have also been working on the bench for at least one year. There is no tuition charge for this course. The course is held at the AmeriSuites Hotel in Sterling, Virginia (near the Washington/Dulles International Airport). A copy of the application form is reproduced on the last page of the August 2004 issue of *Microgram Bulletin*. Completed applications should be mailed to the Special Testing and Research Laboratory (Attention: Pam Smith or Jennifer Kerlavage) at: 22624 Dulles Summit Court, Dulles, VA 20166. For additional information, call 703/668-3337.

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## SCIENTIFIC MEETINGS

**1. Title:** 17th Triennial Meeting of the International Association of Forensic Sciences (IAFS) (First Bimonthly Posting)  
**Sponsoring Organization:** International Association of Forensic Sciences  
**Inclusive Dates:** August 21 - 26, 2005  
**Location:** Hong Kong Convention and Exhibition Centre (Hong Kong)  
**Contact Information:** See Website  
**Website:** [www.iafs2005.com](http://www.iafs2005.com)

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# Computer Corner

Thoughts for the Future

## #192

by Michael J. Phelan  
DEA Digital Evidence  
Laboratory

Over the past two years, the forensic science community has formally recognized the discipline of digital evidence and some of its specializations, including computer forensics, audio analysis, video analysis, and digital imaging analysis. The American Society of Crime Laboratory Directors / Laboratory Accreditation Board ([ascld-lab.org](http://ascld-lab.org)) has already accredited several Federal and state crime laboratories in the digital evidence sub-discipline (or in some instances, dedicated digital evidence laboratories). Another forensic recognition body is the American Academy of Forensic Sciences ([aafs.org](http://aafs.org)), which has recently held workshops on the topic. Undoubtedly, other forensic organizations will soon follow suit. I expect that most digital evidence examination organizations will be accredited by the end of this decade.

However, despite these advances, the vast majority of the practitioners remain isolated within their organizations, and are not even a recognized department in those organizations. In many such cases, the computer forensic examination function is only a part time task, with minimal support. Thus, equipment and tools are limited, budgets are almost non-existent, training (if any) is basic and of short

duration (typically two weeks or less), peer review of examination results is rare, examination tools are not tested (validated), and there is no meaningful or regular proficiency testing program.

The challenge for management - whether a police chief, sheriff, investigative agency director, or crime laboratory director - is to ensure that their organization's digital evidence examination work product is thorough, consistent with accepted best practices, and court-admissible. It is important to define the organization's requirements in detail, establish policies and budgets, and act. Expectations of the court system, and possibly the state legislatures, and (inevitably) defense attorneys, will challenge law enforcement to provide the same quality in their digital evidence work product as that provided in other, more traditional forensic disciplines.

I have seven thoughts for consideration for those law enforcement organizations that are considering initiating or expanding digital evidence programs:

First, prior to starting a program, crime laboratory directors should meet with the heads of the investigative agencies that they service, to decide how best to organize and support digital

evidence functions.

Second (where appropriate), regional associations should be considered as a means to leverage scarce technical resources and budgets.

Once the program has been initiated:

Third, quality review checks of individual examiner work products must be implemented as soon as possible. This can be as simple as one trained examiner reviewing the work of another examiner. In instances where there is only one examiner present, then another trained examiner from another agency should perform the review.

Fourth, an independent certification authority for individual examiners needs to be established. The certification should encompass critical elements such as quality control, examination best practices, and proficiency testing. This authority must be independent of any training, software, or hardware vendor. Re-certification criteria must be substantive and required on a regular, scheduled basis.

Fifth, laboratories with digital evidence examination services need to become accredited.

Sixth, law enforcement

organizations providing only small-scale or part-time digital evidence examination support (i.e., that is not a formal department of their forensic laboratory system), need to ensure that their practitioners are qualified, regularly tested, and currently certified.

And seventh, academia, private industry, government training program managers, and quasi-governmental technical associations, need to meet on a regular basis to exchange points of view and develop a consensus for a national cyber forensic agenda. Computers and associated digital electronic devices will likely eventually become the second largest type of forensic evidence (behind fingerprints) collected at a crime scene, or as evidence seized in an investigation, so such a consensus is critical.

The dramatic advances in digital evidence examination for law enforcement purposes over the past 15 years is a tribute to the efforts of many individuals who identified the growing requirements, and got the job done. There appears to be a quickly growing consensus on digital evidence technical best practices. The Scientific Working Group on Digital Evidence ([swgde.org](http://swgde.org)), the International Association of Computer Investigation Specialists ([iacis.org](http://iacis.org)), and the International Organization of Computer Examiners ([ioce.org](http://ioce.org)), have each published recommended guidelines. The current challenge for law enforcement is ensuring that basic quality control

mechanisms are observed at all levels. Decentralization of the digital evidence examiners at one or two person locations is a management challenge, but one that can be solved. Both crime laboratory directors and law enforcement heads should review their current practices and organizational responsibilities and prepare for the future (which, as we all know, is already here).

Questions or comments:

E-mail: [Michael.J.Phelan-usdoj.gov](mailto:Michael.J.Phelan-usdoj.gov)

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# Microgram

## *Bulletin*

**Published by:**

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**VOL. XXXVIII, NO. 4**

**APRIL 2005**

**- INTELLIGENCE ALERT -**

**COCAINE BRICKS CONTAINING INTERNAL HEROIN BRICKS  
IN NOGALES, ARIZONA**

The DEA Southwest Laboratory (Vista, California) recently received 17 bricks wrapped in plastic, brown tape, and cellophane, containing a compressed white powder, suspected cocaine. The exhibits were seized by the U.S. Border Patrol at the Nogales, Arizona Port of Entry (circumstances not further reported). Upon further examination, however, each brick was also found to contain a second, internal brick, wrapped in brown tape and cellophane, which contained an unknown, compressed, tan colored powder (see Photo 1). The net mass of the white powder in the outer bricks averaged 600 grams per brick, while the net mass of the tan powder in the inner bricks averaged 500 grams per brick



**Photo 1**

(both values very consistent from brick to brick). Analysis of the white powder by GC/FID, LC, GC/MS and FTIR/ATR confirmed 85 percent cocaine hydrochloride adulterated with caffeine, while analysis of the tan powder (same analytical techniques) indicated a mixture of 72 percent heroin hydrochloride and 7.2 percent cocaine hydrochloride. This is the first submission of heroin mini-bricks inside cocaine bricks to the Laboratory.

[Editor's Notes: This appears to be the first ever report of concealing heroin bricks inside cocaine bricks. It is postulated that this unusual concealment technique was utilized to deceive mid-level transporters, who charge higher rates for heroin shipments versus cocaine shipments.]

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### **- INTELLIGENCE ALERT -**

#### **THREAD SPOOLS FROM PERU (CONTAINING COCAINE) AT THE NEWARK INTERNATIONAL AIRPORT**

The DEA Northeast Laboratory (New York, New York) recently received eight spools of white and/or red colored thread, each including a plastic bag containing a white powder within the spool cavities, suspected cocaine (see Photos 2 and 3). The exhibits were seized by Customs and Border Protection personnel from the luggage of a passenger arriving at Liberty



**Photo 2**



**Photo 3**

International Airport (Newark, New Jersey) on a flight from Lima, Peru. It appears that the thread was wrapped onto the spools after the bags of powder were secreted within the spool cavities. Analysis of the powder (total net mass 1,990 grams) by GC/FID, FTIR-ATR, GC/MS, and 1H-NMR confirmed 94 percent cocaine hydrochloride. The Northeast Laboratory routinely encounters cocaine concealed in various objects and containers, but this is the first submission of cocaine concealed within spools of thread [Editorial remarks, next page].



[Editor's Note: A similar exhibit was reported in the April 2003 issue of *Microgram Bulletin*. In that case, the spools contained hashish packaged in brown tape, which were wrapped around the central cannisters of the spools.]

\* \* \* \* \*

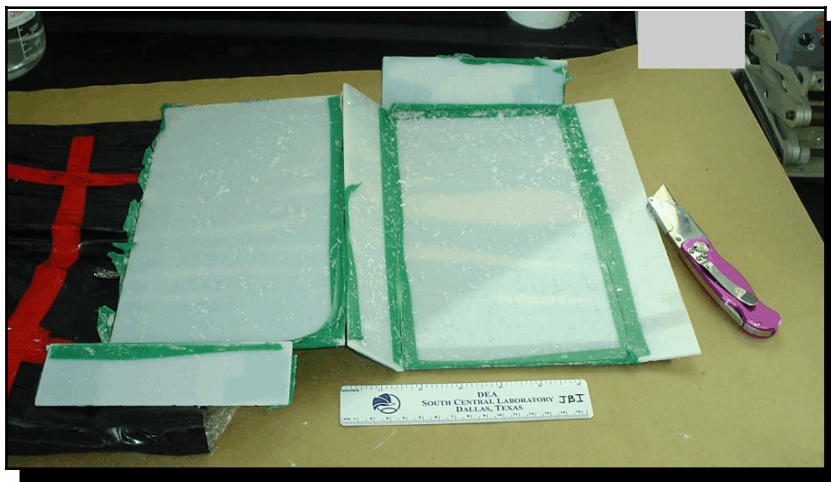
**- INTELLIGENCE ALERT -**

**METHAMPHETAMINE IN PLASTIC/TAPE BOXES IN LAREDO, TEXAS**

The DEA South Central Laboratory (Dallas, Texas) recently received nine rigid bricks wrapped in layers of plastic and black electrical tape, containing a white crystalline powder, suspected methamphetamine. The exhibits were initially seized by Immigration and Customs Enforcement Agents in Laredo, Texas from a hidden compartment in a recent model sedan (details not provided). Unusually, the bricks were found to be encased in a homemade box (10 x 5.75 x 1.5 inches) of white plastic (1.5 millimeters thick), held together with green tape at the seams (see Photos 4 and 5). Analysis of the powder (total net mass 8,065 grams) by FTIR, GC/MS, and HPLC confirmed 86 percent d-methamphetamine hydrochloride. This is the first such submission to the South Central Laboratory. It is unclear why this technique was employed.



**Photo 4**



**Photo 5**

\* \* \* \* \*

**- INTELLIGENCE ALERT -**

**UNUSUAL HEROIN PELLETS AT THE MIAMI INTERNATIONAL AIRPORT**

The DEA Southeast Laboratory (Miami, Florida) recently received 75 body-pack pellets, all containing a white powder, suspected heroin. The pellets were recovered by Immigration and Customs Enforcement personnel from an individual arriving at the Miami International Airport on a flight from Venezuela. Very unusually, the pellet "shells" appeared to consist of cut

sections of plastic syringes (or less likely plastic graduated cylinders), capped at both ends, and covered with an outer layer of rubber (see Photo 6). Analysis of the powder (total net mass 546 grams) by GC/MS and FTIR confirmed 7.3 percent heroin hydrochloride adulterated with caffeine. This was the first submission of pellet shells of this type to the Southeast Laboratory. It is unclear as to why this unusual construction was employed.

[Editor's Notes: This appears to be the first report of pellet shells of this type construction to *Microgram Bulletin*. The purity (7.3 percent) is also a strikingly low percentage for controlled substance pellets arriving from overseas.]



**Photo 6**

\* \* \* \* \*

#### **- INTELLIGENCE ALERT -**

### **MISSOURI STATE HIGHWAY PATROL TROOPERS SEIZE MARIJUANA TRANSPORTED IN A SIMULATED FEDEX VAN**

[From the NDIC *Narcotics Digest Weekly* 2005;4(11):2

Unclassified, Reprinted with Permission;

Some Details Withheld in Accordance with *Microgram* Policy.]

On February 25, 2005, a Missouri State Highway Patrol (MSHP) trooper stopped a rental vehicle for [suspicious driving near] what appeared to be a FedEx van. Both vehicles were traveling east on Interstate 44 in Greene County, near Springfield. The driver of the rental vehicle, a Hispanic male, told the trooper he was escorting the FedEx van, which he said was delivering pharmaceutical supplies to Chicago. [When stopped] the van driver, a Caucasian male, also stated that he was delivering pharmaceuticals to Chicago but could not explain the presence of the [escort] vehicle. Troopers searched the van and discovered 18 large boxes containing 1,266 pounds of marijuana. The investigation is continuing.

NDIC Comment: The van was the same make and model driven by FedEx employees. According to the driver, the van was purchased in 2004 and picked up in Houston. The exterior FedEx decals and logos apparently were produced using computer graphics software and, according to troopers, were indistinguishable from the real thing. The vehicle was also outfitted with a fake global positioning system (GPS) antenna and a fake laptop, which was mounted on the interior center console. The driver of this simulated FedEx van was dressed in dark trousers, a dark blue shirt, and blue baseball cap, the same types of clothing and colors worn by FedEx

drivers. Troopers also found fake bills with FedEx logos inside the van. (Late last year, law enforcement officers in New Mexico seized marijuana from two trucks that had been modified to resemble New Mexico Department of Transportation vehicles.)

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#### **- INTELLIGENCE BRIEF -**

### **MDMA CAPSULES IN VOLUSIA COUNTY, FLORIDA**

The Florida Department of Law Enforcement Daytona Beach Crime Laboratory (Daytona Beach) recently received two clear capsules containing a dark, granular substance with an odor similar to fertilizer, submitted as an unknown/possible controlled substance (see Photo 7). The capsules (total net mass 0.72 grams) were seized in Volusia County by the Volusia County Sheriff's Office (exact location and circumstances of seizure not reported; Daytona Beach is located within Volusia County). Analysis of the solid by Marquis, and of a methanolic extract by GC/FID and GC/MS, indicated MDMA (not quantitated). The cause(s) of the dark coloration and unusual odor were not determined. This was the first ever submission of MDMA in capsule form to the Laboratory.



**Photo 7**

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#### **- INTELLIGENCE BRIEF -**

### **2,5-DIMETHOXY-4-ETHYLPHENETHYLAMINE (2C-E) CAPSULES IN BETTENDORF, IOWA**

The Iowa Criminalistics Laboratory (Des Moines, Iowa) recently received a polydrug case with 14 bags of marijuana (total net mass 143.8 grams) and thirteen clear capsules (20 x 8 millimeters) containing a white powder, suspected mescaline (photo not available). The exhibits were seized by the Quad City (Moline, Rock Island, Davenport, Bettendorf) Metropolitan Enforcement Group (MEG) Task Force during the execution of a search warrant in Bettendorf, Iowa (Bettendorf is located in far eastern Iowa, on the Mississippi River (border with Illinois)). Analysis of the powder (total net mass not exactly measured, but less than one gram) by Marquis, Davidow TLC, and GC/MS, however, indicated not mescaline but rather 2,5-dimethoxy-4-ethylphenethylamine (also known as 2C-E). No standard was available for confirmation; therefore, the identification was based on the mass spectrum of 2C-E as reported in the November 2004 issue of *Microgram Bulletin*, and is tentative. This is the first ever submission of 2C-E to the Laboratory.

**- INTELLIGENCE BRIEF -**

**METHAMPHETAMINE "SUPER LAB" SEIZED IN SMYRNA, GEORGIA**

[From the NDIC *Narcotics Digest Weekly* 2005;4(9):2  
Unclassified, Reprinted with Permission.]

On February 9, 2005, DEA agents seized a methamphetamine laboratory from a Smyrna residence and arrested three illegal aliens from Mexico. During a search of the residence, agents seized over 10 pounds of crystal methamphetamine, 39 pounds of powdered methamphetamine, and several 30- to 55-gallon containers filled with liquid methamphetamine. In addition, agents discovered 24 garbage bags full of empty pseudoephedrine packages that would have held an estimated 240,000 tablets.

*NDIC Comment:* Demand for powdered and crystal methamphetamine has been increasing in Atlanta. Law enforcement reporting indicates that Atlanta is becoming a distribution center for methamphetamine destined for drug markets throughout the Southeast. As demand for methamphetamine increases in the Atlanta area and as the city becomes a more prominent distribution center, law enforcement officers may encounter an increasing number of methamphetamine super labs not only in Atlanta but also throughout Georgia.

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**- INTELLIGENCE BRIEF -**

**OKLAHOMA HIGHWAY PATROL TEAM SEIZES 10 POUNDS OF MEXICAN BLACK TAR HEROIN INTENDED FOR DISTRIBUTION IN PENNSYLVANIA**

[From the NDIC *Narcotics Digest Weekly* 2005;4(10):2  
Unclassified, Reprinted with Permission;  
Some Details Withheld in Accordance with *Microgram* Policy.]

On February 4, 2005, an Oklahoma Highway Patrol (OHP) Interdiction Team seized 10 pounds of Mexican black tar heroin during a vehicle stop on the Will Rogers Turnpike in Craig County. An OHP trooper stopped the driver of an eastbound Pennsylvania-licensed sport-utility vehicle for failure to signal a lane change. [Due to the driver's behavior], the OHP trooper requested a driver's license check. While awaiting receipt of the information, the trooper walked his drug-detection canine around the vehicle, and the dog alerted to the [SUV's] passenger side. A probable cause search of the vehicle revealed two false compartments in the rocker panels in which seven plastic-wrapped bundles of heroin weighing a total of 10 pounds were discovered. In conjunction with this incident, another OHP trooper executed a safety check stop on a second vehicle, an Oklahoma-licensed [vehicle] with three male occupants. [Due to some common items found in both vehicles], OHP troopers determined that the drivers had been traveling together. The driver of the SUV eventually explained that the four men had departed from Pennsylvania, paid for the heroin shipment in El Paso (TX), and picked up the heroin in Santa

Rosa (NM). They were transporting the heroin to Pennsylvania when they were stopped. All four were arrested.

NDIC Comment: This 10-pound seizure of Mexican black tar heroin surpasses the 9.5-pound total seized by the OHP over the last 3 years combined. Heroin is not commonly seized along Oklahoma's highways. In fact, heroin ranks well below marijuana, cocaine, methamphetamine, and crystal methamphetamine in quantities seized during highway interdictions in the state. Most of the heroin available in Pennsylvania is South American white powdered heroin obtained from sources of supply in New York City. Mexican black tar heroin is not commonly available or abused in Pennsylvania.

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### **- INTELLIGENCE BRIEF -**

#### **LEGISLATION INTRODUCED TO FIGHT ILLEGAL SALE OF PRESCRIPTION DRUGS ON THE INTERNET**

[From the NDIC *Narcotics Digest Weekly* 2005;4(10):3  
Unclassified, Reprinted with Permission.]

On February 16, 2005, the Ryan Haight Internet Pharmacy Consumer Protection Act of 2005 (H.R. 840) was introduced in Congress. The bill--which is named after an 18-year-old who died in 2001 after overdosing on Vicodin (hydrocodone) purchased from an Internet pharmacy without a prescription--would amend the Federal Food, Drug, and Cosmetic Act to ban the sale of prescription drugs over the Internet without a valid prescription. Key components of the bill include requiring Internet pharmacy web sites to clearly identify the business, pharmacist, and physician associated with the pharmacy and the states in which these persons are authorized to dispense or prescribe prescription drugs; prohibiting a web site from referring a customer to a physician who will write a prescription without having examined the patient; and providing state attorneys general with the authority to shut down rogue Internet pharmacy sites across the country rather than only in their state. The bill is being endorsed by the Office of National Drug Control Policy (ONDCP) and several medical and consumer protection associations. An identical bill will be introduced in the Senate.

NDIC Comment: Online pharmacies that sell prescription drugs without requiring a valid prescription are an increasing problem. In 2004 the National Center on Addiction and Substance Abuse (CASA) at Columbia University conducted a study involving 495 web sites that linked to 157 anchor web sites where Schedule II through V controlled prescription drugs could be ordered. According to the CASA White Paper published in February 2004, which detailed the results of the study, of the 157 Internet web sites selling controlled prescription drugs, only 6 percent (10) required a prescription, 90 percent (141) did not require a prescription, and 4 percent (6) made no mention of prescriptions. Of the sites that did not require a prescription, 64 stated that no prescription was needed, and the remaining 77 sites offered an "online consultation." While the Ryan Haight Act will not provide a means to prosecute owners of web

sites operating from overseas, it will provide a means for prosecuting owners of web sites selling prescription drugs within the United States, even if those sites are not physically located in the jurisdiction of the prosecuting office.

\* \* \* \* \*

## SELECTED REFERENCES

[Notes: Selected references are a compilation of recent publications of presumed interest to forensic chemists. Unless otherwise stated, all listed citations are published in English. Listed mailing address information (which is sometimes cryptic or incomplete) exactly duplicates that provided by the abstracting services. Patents are reported only by their *Chemical Abstracts* citation number.]

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4-MTA. Contact: Univ Coimbra, Fac Ciencias & Tecnol, Unidade I&D Quim Fis Mol, Ap 3126, P-3001401 Coimbra, Portugal.]

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8. Qi XH, Mi JQ, Zhang XX, Chang WB. **Preparation and application of an immunoaffinity column for direct extraction of morphine and its analogs from opium.** Chinese Chemical Letters 2004;15(11):1323. [Editor's Notes: The presented method uses an IAC for isolation and CE for analysis. The four alkaloids that are selectively isolated are morphine, codeine, dionin, and thebaine. Contact: The Key Lab of Bioorganic Chemistry and Molecular Engineering, Peking University, Beijing, Peop. Rep. China 100871.]
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3. Claxton LD. **Scientific authorship.** Mutation Research 2005;589(1):17. [Editor's Notes: A review of scientific fraud in papers. Contact: Environmental Carcinogenesis Division, U.S. Environmental Protection Agency, National Health and Environmental Effects Research Laboratory, Mail Drop B143-06, Research Triangle Park, NC 27709.]

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## NEW EMAIL ADDRESSES NEEDED

The email addresses for the following organizations have returned rejection notices to the *Microgram* Editor for the past three email notifications of *Microgram Bulletin*, and will therefore be dropped from the subscription list unless a corrected email address is provided by April 30, 2005. Note that the errors include anti-spamming, mailbox full, user not found, or user unknown messages. The Editor requests your assistance in contacting these organizations, determining if they wish to remain on the *Microgram* subscription e-net, and if so asking them to provide a valid email address to the Editor at: [microgram\\_editor-at-mailsnare.net](mailto:microgram_editor-at-mailsnare.net)

Police - Mossos Desquadra, Barcelona, Spain

**The following organizations (listed in the February issue) will also be dropped on April 30th, 2005:**

Alabama Department of Forensic Sciences - Birmingham, Dothan, and Huntsville Laboratories

Caroline County Sheriff's Department, Denton, MD

Connecticut Department of Public Safety, Division of Scientific Services, Meriden, CT

Georgia Bureau of Investigation, Central Region Medical Examiner's Office, Dry Branch, GA

G.J. Kupferschmidt Consulting, Ontario, Canada

Glendale Police Department, Special Investigations Unit, Glendale, AZ

Kaiser-Permanente Regional Laboratory, Portland, OR

Kentucky State Police - All Laboratories (ISP appears to have changed)

Laboratory for Clinical and Forensic Toxicology, Antwerp, Belgium

Morris County Sheriff's Crime Laboratory, Morristown, NJ

National Bureau of Investigation, Vantaa, Finland

Newark Police Department, Forensic Laboratory, Newark, NJ

Office of the Deputy Assistant Secretary of Defense for Counternarcotics, Washington, DC

Oklahoma City Police Department, Forensic Drug Laboratory, Oklahoma City, OK

Sheridan Police Department, Sheridan, CO

U.S. SOUTHCOM (Herndon, VA Office (Counternarcotics))

USACIL, Hickam AFB, HI

Washington State Patrol - All Laboratories (ISP appears to have changed)

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## THE JOURNAL/TEXTBOOK COLLECTION EXCHANGE

There were no offerings of journals or textbooks made over the past quarter.

**Subscribers are encouraged to donate surplus or unwanted items or collections; if interested, please consult the *Microgram* website or contact the *Microgram* Editor for further instructions.**

The next offering of journals and textbooks will be in the July 2005 issue of *Microgram Bulletin*.

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## THE DEA FY - 2005 STATE AND LOCAL FORENSIC CHEMISTS SEMINAR SCHEDULE

The remaining FY - 2005 schedule for the DEA's State and Local Forensic Chemists Seminar is as follows:

May 9 - 13, 2005  
July 11 - 15, 2005  
September 19 - 23, 2005

Note that the school is open only to forensic chemists working for law enforcement agencies, and is intended for chemists who have completed their agency's internal training program and have also been working on the bench for at least one year. There is no tuition charge for this course. The course is held at the AmeriSuites Hotel in Sterling, Virginia (near the Washington/Dulles International Airport). A copy of the application form is reproduced on the last page of the August 2004 issue of *Microgram Bulletin*. Completed applications should be mailed to the Special Testing and Research Laboratory (Attention: Pam Smith or Jennifer Kerlavage) at: 22624 Dulles Summit Court, Dulles, VA 20166. For additional information, call 703/668-3337.

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# Computer Corner

Search Warrant Language

# #193

by Michael J. Phelan  
DEA Digital Evidence  
Laboratory

Search warrant narratives must be both clearly phrased and sufficiently comprehensive to ensure that the needed investigative information is properly (legally) collected at the time of seizure. The unusual nature and complexity of digital evidence represents an additional challenge for law enforcement personnel who are charged with drafting search warrant narratives, for both technical and jurisdictional reasons. Some digital evidence search warrant language considerations include:

## **Evidence Removal Contingency**

Search warrant language specifying the intent of law enforcement to duplicate a computer on-site should always contain a statement that a reasonable effort will be made to copy data on-site, but also that *law enforcement retains the right to remove the computer and related accessories to its laboratory for technical reasons or where the time required to complete the search on site will significantly disrupt the owner or business operation.*

Technical concerns may

include, for example, hard drive access problems associated with the duplication of laptop hard drives, or password protected hard drives. Similarly, accessing the inside of a laptop computer is a delicate and time-consuming task. It often involves the removal many small screws, and requires gentle manipulations once disassembled. Undertaking such a technical task is best accomplished in a laboratory environment. Other examples of scenarios that would require an excessive on-site presence include backing up a very large hard drive, or copying numerous computers.

In such cases, the presence of law enforcement on-site for a long period of time (as long as 24 hours) is much more disruptive than simply removing the target computer. When removal of seized evidence is required by such circumstances, duplication and return of the evidence should be made as soon as practical. This is usually one to four work days, depending on the amount of work effort required and the distance between the seizure site and

the digital evidence laboratory.

## **Off-Site Data Storage**

A second important consideration in search warrant language covers the possibility that some or all of the needed investigative data may be stored at an off-site location. Such remote storage locations can either be part of the business under investigation, or simply a service provided by a third party provider. These services, commonly referred to as Network Area Storage (NAS), web hosts, or data farms, are frequently used in business and are becoming increasingly popular for individuals. In such cases, the data is typically accessible over a network connection (usually closed in-house or through a secure Internet link) from the main business location. In these situations, a second search warrant request should be submitted to a judge once the off-site location has been identified.

Logistically, the second search warrant may be complex since the actual physical location may be difficult to identify and it may

be (and probably will be) located in another jurisdiction. Search warrants for data located in another country are even more complex, and requests should be coordinated through the respective United States Attorney's Office pursuant to international agreements and laws. It is virtually impossible to achieve rapid seizures in such scenarios.

### **Consent Searches**

An alternative strategy that is highly recommended is to secure consent from an authorized person to "pull the data" (using existing data access privileges) from the targeted network. The consent warrant should include an *explicit statement authorizing copying of remotely stored data*. Ideally, it should be written, signed, dated, and witnessed.

In addition, there are special legal considerations for third party entities (e-mail hosting businesses) that store unopened e-mail *that is less than 180 days old* (unopened e-mail that is more than 180 days old requires a subpoena). This is a complex area of law, and it is recommended that all third party e-mail downloading should be closely coordinated with the respective United States Attorney's Office or state prosecutor's office.

### **Wireless Networking**

A third recommended search warrant language consideration involves local networks containing wireless technology. On-site copying of local networks can be a complex undertaking. The use of wireless technology needs to be verified, and the location of the remote wireless devices then need to be established. More and more businesses and individuals are using wireless networks to link computers. Search warrants that authorize the search of a local network should include language that specifies that devices that are *attached through a wireless connection are considered part of the local network*. However, if the remote wireless devices are located outside the physical address authorized in the search, either a second search or consent warrant may be needed to "pull" data from across the wireless network.

### **Installation Software or Specialized Hardware Seizure**

A fourth area of search warrant language involves securing the authority to seize not only the computer evidence but supporting system documentation and software. Frequently, businesses use highly specialized and/or proprietary software, and (as a result) the resulting data cannot be easily recovered without that

software. For example, hard drive duplicates of data formatted in a Unix operating system are not easily examined on a government owned/examination computer. It is therefore important that the warrant include authorization to *seize the installation software to facilitate accurate and rapid recovery of the needed information*.

Similarly, in some instances, it may be appropriate to take special hardware devices that are needed to perform the examination. Examples include unusual tape drives, computers that contain proprietary motherboards, processing chips sets (such as RISC or PERC technology), other unique internal components, or external access devices such as biometric readers. Warrants should contain language giving the seizing officials the flexibility to seize unusual hardware that will possibly be needed in the recovery of data stored on a computer or some form of unusual storage media.

### **Scope of Warrant Language**

A fifth area of concern involving search warrant language involves the description of the type(s) of information to be seized. If the language selection is too broad, the warrant could possibly be challenged with regards to its scope. On the



other hand, wording that is too narrow needlessly restricts the investigator's ability to document criminal activity particularly in suspected conspiratorial cases. Investigators should define the scope consistent with the suspected criminal activity. If evidence of an unrelated crime is identified during the course of a digital evidence examination, then a second search warrant can be obtained at that time.

#### **Technical Terminology**

A sixth area of search warrant language should focus on selection of proper technical terminology. It is not recommended that enumeration of digital storage devices be made unless it includes a general global phrase such as "*any and all digital data storage devices and media*" because inevitably, new forms of storage technology will arise that possibly could not be seized using a stricter interpretation.

Additionally, the warrant should avoid reference to "magnetic" storage media since more and more devices are optically based. It is recommended that the language be kept simple and state "*digital storage media and devices*".

Similarly, the use of the term "electronic" should be avoided, because this term is

more associated with data transmission (both analog and digital) than it is with digital data storage devices.

The nature of personal and business computing is ever changing. Law enforcement must maintain continuous awareness of where data is located, how it is stored, and how it is accessed. Search warrant authorizations must anticipate remote data storage, networking, and non-magnetic data media. Failure to have the appropriate search warrant language could result in delayed or missed investigative opportunities. Further discussion of computer search and seizure law can found in the US Department of Justice's July 2002 publication [Searching and Seizing Computers and other Electronic Evidence in a Criminal Investigation](#) located on the web at: [www.usdoj.gov/criminal/cybercrime](http://www.usdoj.gov/criminal/cybercrime).

Questions or comments:  
E-mail: [Michael.J.Phelan](mailto:Michael.J.Phelan@usdoj.gov)  
-at- [usdoj.gov](http://usdoj.gov)



# Microgram

## *Bulletin*

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**VOL. XXXVIII, NO. 5**

**MAY 2005**

**- INTELLIGENCE ALERT -**

**DIPROPYLTRYPTAMINE AND 5-METHOXY-*ALPHA*-METHYLTRYPTAMINE  
IN ST. MARY'S COUNTY, MARYLAND**

The Maryland State Police - Forensic Sciences Division (Pikesville, Maryland) received a submission of three glass vials (approximately 4.5 x 1.3 centimeters) with (presumed) manufacturers' labels reading "N,N-Dipropyltryptamine HCl", "5-Methoxy-*alpha*-methyltryptamine (5-MeO-AMT)", and "5-Methoxy-N,N-dimethyltryptamine", along with some greenish-brown vegetable matter and a multi-colored glass-smoking device. An Emergency Medical Technician recovered the items from a college student who passed out in a campus dormitory lobby (campus located in St. Mary's County). The student later confessed to buying the vials off of the Internet, origin unknown. Two of the glass vials were blue; the label on one vial included a white horseshoe enclosed in a blue circle, and the other label included the letters "rac" in green hexagons. The third vial was brown with no logos (see Photos 1 and 2, next page). Each vial contained a sweet smelling, off-white powder (net weights not taken). Analysis by color testing, UV/Vis, FTIR, and GC/MS confirmed N,N-dipropyltryptamine, 5-MeO-AMT, and 5-methoxy-N,N-dimethyltryptamine in the vials so labelled (not quantitated). Additional analyses by color testing, UV-Vis, and GC-MS indicated that the greenish-brown vegetable matter contained no controlled substances, but that the smoking device contained 5-methoxy-N,N-dimethyltryptamine. It is suspected that the greenish-brown vegetable matter was used as a

medium for smoking the tryptamines. This was the first known submissions of these types to the Forensic Sciences Division. None of the identified tryptamines are currently controlled under Maryland statutes.

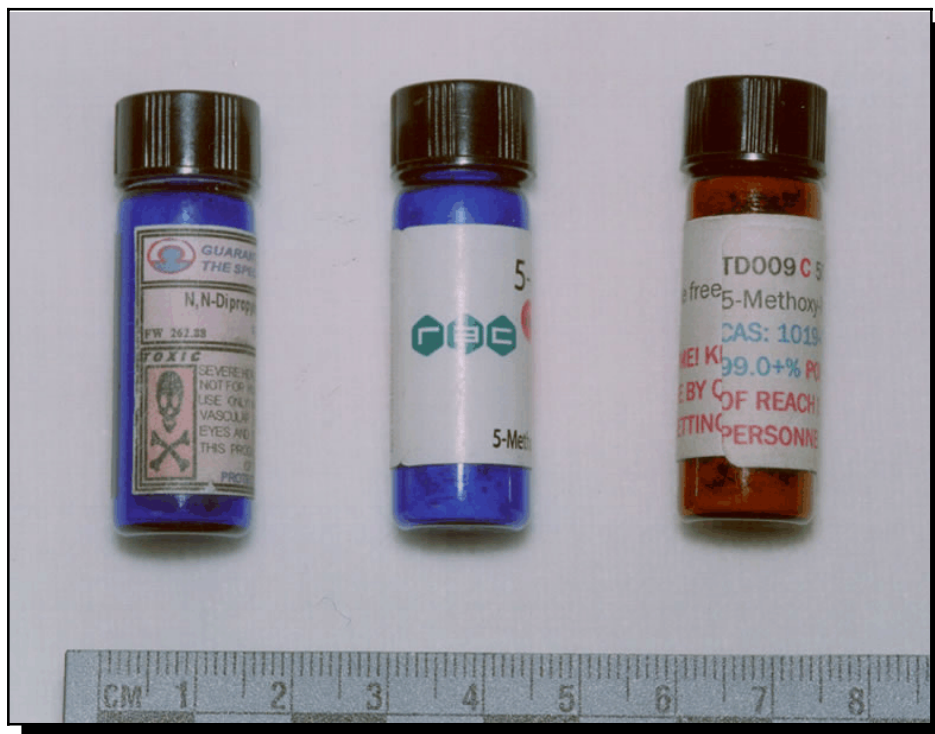


Photo 1



Photo 2

**- INTELLIGENCE ALERT -**

**POSSIBLE PEYOTE (PLANT MATERIAL CONTAINING MESCALINE)  
IN WADSWORTH, ILLINOIS**

The Northern Illinois Police Crime Laboratory in Highland Park, Illinois recently received a plastic bag containing an atypical, dried, plant material (see Photo 3). The material (total net mass 25.05 grams) was seized in Wadsworth, Illinois, by the Lake County Sheriff's Office (circumstances of seizure not reported; Wadsworth is located nearly equidistant between Chicago, Illinois and Milwaukee, Wisconsin). The material produced a purple color when directly tested with the Marquis reagent, but a dried methanol extract produced an orange color. Analysis by GC/MS indicated mescaline, suggesting that the material was peyote or some other mescaline-containing cactus (could not be further identified). This was the first submission of this type to the Laboratory.



**Photo 3**

\* \* \* \* \*

**- INTELLIGENCE ALERT -**

**CAPSULES CONTAINING A MIXTURE OF MDMA, DIAZEPAM, AND  
PSILOCIN IN BELLINGHAM, WASHINGTON**

The DEA Western Laboratory (San Francisco, California) recently received a submission of five clear capsules measuring 20 millimeters in length by 7 millimeters in diameter, and containing an average of 326 milligrams of light brown powder, suspected to be a controlled substance (photo not available). The exhibit was acquired in conjunction with other MDMA and cocaine exhibits by DEA Special Agents in Bellingham, Washington. Analysis of a basic extract of the powder by GC/MS indicated a mixture of MDMA and diazepam. However, close visual observation of the light brown powder removed from the capsules also showed large particles of spongy material, consistent with psilocybin mushrooms. Further (microscopic) examination revealed blue coloring in the spongy material (also suggestive of psilocybin mushrooms). Analysis of an acetic acid/ammonia base extraction of the material by GC/IRD confirmed psilocin, MDMA and diazepam. The MDMA was quantitated at 9.9 milligrams per capsule. The psilocin and diazepam were estimated to be present at less than 1% and 5%, respectively. This was the first submission to the Western Laboratory of capsules containing a mixture of MDMA, psilocybin mushrooms, and diazepam.

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**- INTELLIGENCE ALERT -**

**CERAMIC “SUN FACE” STATUES CONTAINING MARIJUANA BRICKS (FROM MEXICO) IN PRINCE GEORGES COUNTY, MARYLAND**

The DEA Mid-Atlantic Laboratory (Largo, Maryland) recently received 35 ceramic rectangular statues with a sun face, each containing various sized bricks of compressed plant material packaged in black or pink plastic wrap, suspected marijuana (see Photos 4 and 5). The statues were shipped in wooden crates from Jalisco, Mexico to Alexandria, Virginia via a commercial mail service, and were seized by the Prince George’s County Police Department after an employee of the mail service company observed the suspected marijuana in a damaged crate. The bricks ranged from 4 to 12 inches in length, and from 0.4 to 1.0 kilograms in weight. Analysis of the plant material (total net mass 34.9 kilograms) by mass spectrometry, microscopy, and color testing confirmed marijuana (THC not quantitated). This was the Mid-Atlantic Laboratory's first encounter with this smuggling technique for marijuana.

\* \* \* \* \*



**Photo 4**



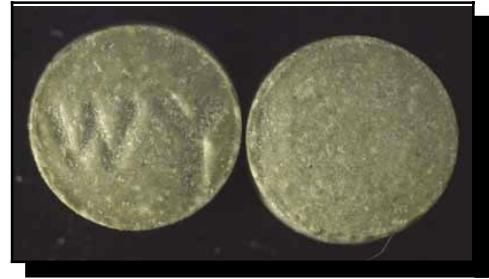
**Photo 5**

**- INTELLIGENCE ALERT -**

**“THAI TABS” CONTAINING CANNABINOL AND CAFFEINE IN BANGKOK, THAILAND**

The DEA Special Testing and Research Laboratory (Dulles, Virginia) recently received four mottled green colored tablets with a “WY” logo, apparent “Thai Tabs” (see Photo 6, next page). A second exhibit submitted with the tablets was a green powder matching the tablet color. The exhibits were obtained as a free sample from a confidential source in Bangkok, Thailand.

“Thai Tabs” (also known as “Ya-Ba” tablets) usually contain 10 - 20 percent d-methamphetamine HCl and 80 - 90 percent caffeine. The tablets in this case had an average tablet weight of 103 milligrams, a diameter of 6.05 millimeters, a width of 3 millimeters, and were otherwise unremarkable. Analysis by GC, GC/MS, FTIR, and NMR, however, indicated not a mixture of methamphetamine and caffeine but rather a mixture of 1.5 milligrams of cannabinal and 90 milligrams of caffeine per tablet. The powdered material (total net mass 0.90 grams) contained 1.6 percent cannabinal and 87 percent caffeine. This is the first time the Special Testing and Research Laboratory has encountered cannabinal in any tablet form.



**Photo 6**

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### **- INTELLIGENCE ALERT -**

#### **HASHISH LABORATORY SEIZURE IN SANTA CRUZ, CALIFORNIA YIELDS THC-LACED FOOD PRODUCTS**

[From the NDIC *Narcotics Digest Weekly* 2005;4(14):3  
Unclassified, Reprinted with Permission.]

On March 9, 2005, members of the Santa Cruz Marijuana Enforcement Team (MET) and the Santa Cruz County Narcotics Enforcement Team (SCCNET) seized a hydroponic cannabis grow site and a hashish (hash) production operation. Law enforcement officers executed a search warrant at a Santa Cruz residence from which a 41-year-old male and a 24-year-old female allegedly distributed marijuana. Officers seized 27 hydroponic cannabis plants, 22 pounds of marijuana, approximately 1.5 gallons of hash oil (or "honey oil"), about 1.5 ounces of hash powder, 2 pounds of psilocybin mushrooms, marijuana and hash production equipment, and \$2,820. Officers also seized a cheesecake, nut ball, 2 dozen chocolate chip cookies, cookie dough, and 10 pounds of butter, all laden with THC (*delta-9-tetrahydrocannabinol*), the primary psychoactive chemical in marijuana and hash. The occupants were charged with possession of marijuana with intent to distribute and with production of hash; in addition to those charges, the male occupant was charged with possession of hallucinogenic psilocybin mushrooms.

NDIC Comment: All parts of the cannabis plant, including stems and leaves that typically are discarded in many cannabis grow operations, are used in the production of hash in order to extract additional THC. Although THC is soluble in very few substances, it dissolves in butane and in fats such as butter. Cannabis was mixed into melted butter that later was used as an ingredient in the seized THC-laden food products. Hash oil was produced by steeping cannabis in liquid butane, a highly volatile and flammable substance, to extract the THC into a concentrated, honey-colored liquid. Direct contact with butane in its gaseous form can cause asphyxia and in its liquid form can cause frostbite. Hash oil cooks often attempt to hasten butane evaporation by heating the butane-cannabis mixture on a stove or other heat source, further risking asphyxiation and explosion. Hash production is uncommon in the United States.



**- INTELLIGENCE BRIEF -**

**LARGE SEIZURE OF BLACK TAR HEROIN IN CICERO, ILLINOIS**

The DEA North Central Laboratory (Chicago, Illinois) recently received four cylindrical packages, each wrapped in black and red electrical tape, and each containing several white plastic bags, which in turn contained a very hard, compressed mass of a dark brown solid (total net mass 2004 grams), suspected black tar heroin (see Photo 7). The exhibits were acquired in Cicero, Illinois by Special Agents from the DEA Chicago Division. Analysis of a composited sample (ground to 20 mesh size) by GC and GC/MS confirmed 14 percent heroin (calculated as the hydrochloride salt), along with



**Photo 7**

O6-monoacetylmorphine (about 19 percent of the heroin peak), acetylcodeine (about 13 percent of the heroin peak), and several minor components: Papaverine, noscapine, meconin, and hydrocotarnine (each less than 1 percent of the heroin peak). Color testing and FTIR analyses were also performed; however, due to the consistency of the exhibit, these latter tests were inconclusive. It is not known why these exhibits were so hard. The North Central Laboratory rarely receives exhibits of black tar heroin of this size.

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**- INTELLIGENCE BRIEF -**

**MDMA LABORATORY SEIZED NEAR UNIVERSITY IN BLACKSBURG, VIRGINIA**

[From the NDIC *Narcotics Digest Weekly* 2005;4(14):1  
Unclassified, Reprinted with Permission.]

On February 16, 2005, the U.S. Attorney for the Western District of Virginia announced the unsealing of a three-count, federal grand jury indictment dated February 10, 2005, that charges two men with the operation of a clandestine MDMA (3,4-methylenedioxymethamphetamine, also known as ecstasy) laboratory in Blacksburg. On February 1, 2005, Drug Enforcement Administration (DEA) agents, Blacksburg Police Department officers, and Virginia State Police officers served a search warrant at a Blacksburg residence, which was located less than 600 feet from a university campus, and seized the laboratory. The laboratory was located in the basement and had been operational for 2 years but less than 350 grams of MDMA had been produced in three production cycles - 100 grams each in the first and second cycles and 150 grams in the third cycle. At the time of the seizure, the laboratory operator was in the midst of the fourth

production cycle; he had hoped to produce his largest quantity - 500 to 1,000 grams. The accused laboratory operator was an undergraduate computer science major at the local university who had taken several chemistry courses. The second defendant, the alleged distributor, sold the MDMA in capsules containing approximately 80 milligrams for \$14 to \$16 per capsule in the Blacksburg area and in other cities in Virginia and North Carolina, and in Washington, D.C. The defendants also hosted rave parties in their basement laboratory, resulting in endangerment charges. Federal authorities seek the forfeiture of more than \$150,000, including laboratory cleanup costs. The defendants face a maximum penalty of 70 years in prison and/or a fine of \$3.25 million.

NDIC Comment: According to the Virginia State Police, this was the first laboratory seized in the Western District of Virginia and the largest MDMA laboratory seized in the state. Most of the MDMA available in Virginia - and in the continental United States - is produced in Europe. However, MDMA laboratories have been seized near universities in Arizona, California, Louisiana, New York, Pennsylvania, Tennessee, Texas, and Wisconsin. It is fairly common for laboratory operators to gain knowledge of chemical techniques by taking college courses. Teenagers and young adults are the primary MDMA abusers, and producers and distributors of the drug may choose to operate near universities because of the disproportionately high number of young adults in those areas. This laboratory was one of the larger MDMA laboratories seized in the United States, according to El Paso Intelligence Center (EPIC) National Clandestine Laboratory Seizure System (NCLSS) data. Although the laboratory operator had produced small quantities of MDMA before the laboratory seizure, the production capacity during the final cycle was 500 to 1,000 grams--or 1.1 to 2.2 pounds. Of the 16 MDMA laboratories seized in the United States in 2004 and reported to the NCLSS, only two had a production capacity of 2 pounds or more.

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#### **- INTELLIGENCE BRIEF -**

### **ROUTINE TRAFFIC STOP NEAR SALEM, OREGON RESULTS IN THE SECOND-LARGEST SEIZURE OF MDMA IN STATE HISTORY**

[From the NDIC *Narcotics Digest Weekly* 2005;4(14):4  
Unclassified, Reprinted with Permission.]

On February 27, 2005, a routine traffic stop on Interstate 5 south of Salem led to the discovery of approximately 6.5 pounds of MDMA, reportedly the largest seizure of MDMA in the last 2 years in Oregon and the second largest in the state. An Oregon State Police (OSP) trooper stopped the driver of a rental vehicle for speeding and failure to signal a lane change. A consensual search of the vehicle revealed 9,876 light green MDMA tablets packaged in three cellophane-wrapped bags hidden in the trunk--two bags in the spare tire compartment and one behind the wheel well side paneling. Each bag was the size of a 2-pound bag of brown sugar. Currency totaling \$1,061 also was seized. The driver, a resident of Henderson (NV), claimed he was a physical fitness consultant and a bodyguard and told OSP authorities that he had flown to Seattle and was driving back to Las Vegas. Rental documentation indicated that the vehicle was to be dropped off in Las

Vegas within a 24-hour period. The driver was arrested and charged with possession and delivery of a Schedule I controlled substance.

NDIC Comment: Stringent security measures at airports throughout the country have caused drug traffickers to use private and commercial vehicles to transport drugs via highways. In this case, the suspect flew to Seattle - a major Pacific Region drug distribution center - to obtain MDMA and rented a vehicle to drive the drug to Las Vegas - a major MDMA consumption market - avoiding detection by airport security.

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## Selected Intelligence Brief

### Anabolic Steroid Control Act of 2004 (Additional Information)

On October 22, 2004 the President signed into law the Anabolic Steroid Control Act of 2004, Public Law 108-358 (see *Microgram Bulletin* 2004;37(12):210). The new provision became effective January 20, 2005, and brought to 59 the total number of steroids controlled. Per numerous requests to the *Microgram* Editor, the 59 steroids are listed below:

(i) androstenediol:

(I) 3 $\beta$ ,17 $\beta$ -dihydroxy-5 $\alpha$ -androstane; and

(II) 3 $\alpha$ ,17 $\beta$ -dihydroxy-5 $\alpha$ -androstane;

(ii) androstenedione (5 $\alpha$ -androst-3,17-dione);

(iii) androstenediol:

(I) 1-androstenediol (3 $\beta$ ,17 $\beta$ -dihydroxy-5 $\alpha$ -androst-1-ene);

(II) 1-androstenediol (3 $\alpha$ ,17 $\beta$ -dihydroxy-5 $\alpha$ -androst-1-ene);

(III) 4-androstenediol (3 $\beta$ ,17 $\beta$ -dihydroxy-androst-4-ene); and

(IV) 5-androstenediol (3 $\beta$ ,17 $\beta$ -dihydroxy-androst-5-ene);

(iv) androstenedione:

(I) 1-androstenedione ([5 $\alpha$ ]-androst-1-en-3,17-dione);

(II) 4-androstenedione (androst-4-en-3,17-dione); and

(III) 5-androstenedione (androst-5-en-3,17-dione);

(v) bolasterone (7 $\alpha$ ,17 $\alpha$ -dimethyl-17 $\beta$ -hydroxyandrost-4-en-3-one);

(vi) boldenone (17 $\beta$ -hydroxyandrost-1,4,-diene-3-one);

- (vii) calusterone (7 $\beta$ ,17 $\alpha$ -dimethyl-17 $\beta$ -hydroxyandrost-4-en-3-one);
- (viii) clostebol (4-chloro-17 $\beta$ -hydroxyandrost-4-en-3-one);
- (ix) dehydrochloromethyltestosterone (4-chloro-17 $\beta$ -hydroxy-17 $\alpha$ -methyl-androst-1,4-dien-3-one);
- (x)  $\Delta^1$ -dihydrotestosterone (a.k.a. “1-testosterone”) (17 $\beta$ -hydroxy-5 $\alpha$ -androst-1-en-3-one);
- (xi) 4-dihydrotestosterone (17 $\beta$ -hydroxy-androstan-3-one);
- (xii) drostanolone (17 $\beta$ -hydroxy-2 $\alpha$ -methyl-5 $\alpha$ -androstan-3-one);
- (xiii) ethylestrenol (17 $\alpha$ -ethyl-17 $\beta$ -hydroxyestr-4-ene);
- (xiv) fluoxymesterone (9-fluoro-17 $\alpha$ -methyl-11 $\beta$ ,17 $\beta$ -dihydroxyandrost-4-en-3-one);
- (xv) formebolone (2-formyl-17 $\alpha$ -methyl-11 $\alpha$ ,17 $\beta$ -dihydroxyandrost-1,4-dien-3-one);
- (xvi) furazabol (17 $\alpha$ -methyl-17 $\beta$ -hydroxyandrostan[2,3-c]-furazan);
- (xvii) 13 $\beta$ -ethyl-17 $\alpha$ -hydroxygon-4-en-3-one;
- (xviii) 4-hydroxytestosterone (4,17 $\beta$ -dihydroxy-androst-4-en-3-one);
- (xix) 4-hydroxy-19-nortestosterone (4,17 $\beta$ -dihydroxy-estr-4-en-3-one);
- (xx) mestanolone (17 $\alpha$ -methyl-17 $\beta$ -hydroxy-5 $\alpha$ -androstan-3-one);
- (xxi) mesterolone (1 $\alpha$ -methyl-17 $\beta$ -hydroxy-[5 $\alpha$ ]-androstan-3-one);
- (xxii) methandienone (17 $\alpha$ -methyl-17 $\beta$ -hydroxyandrost-1,4-dien-3-one);
- (xxiii) methandriol (17 $\alpha$ -methyl-3 $\beta$ ,17 $\beta$ -dihydroxyandrost-5-ene);
- (xxiv) methenolone (1-methyl-17 $\beta$ -hydroxy-5 $\alpha$ -androst-1-en-3-one);
- (xxv) 17 $\alpha$ -methyl-3 $\beta$ , 17 $\beta$ -dihydroxy-5 $\alpha$ -androstane;
- (xxvi) 17 $\alpha$ -methyl-3 $\alpha$ ,17 $\beta$ -dihydroxy-5 $\alpha$ -androstane;
- (xxvii) 17 $\alpha$ -methyl-3 $\beta$ ,17 $\beta$ -dihydroxyandrost-4-ene.
- (xxviii) 17 $\alpha$ -methyl-4-hydroxynandrolone (17 $\alpha$ -methyl-4-hydroxy-17 $\beta$ -hydroxyestr-4-en-3-one);
- (xxix) methyldienolone (17 $\alpha$ -methyl-17 $\beta$ -hydroxyestra-4,9(10)-dien-3-one);
- (xxx) methyltrienolone (17 $\alpha$ -methyl-17 $\beta$ -hydroxyestra-4,9-11-trien-3-one);
- (xxxi) methyltestosterone (17 $\alpha$ -methyl-17 $\beta$ -hydroxyandrost-4-en-3-one);

- (xxxii) mibolerone (7 $\alpha$ ,17 $\alpha$ -dimethyl-17 $\beta$ -hydroxyestr-4-en-3-one);
- (xxxiii) 17 $\alpha$ -methyl- $\Delta$ <sup>1</sup>-dihydrotestosterone (17 $\beta$ -hydroxy-17 $\alpha$ -methyl-5 $\alpha$ -androst-1-en-3-one) (a.k.a. “17-a-methyl-1-testosterone”);
- (xxxiv) nandrolone (17 $\beta$ -hydroxyestr-4-en-3-one);
- (xxxv) norandrostenediol:
- (I) 19-nor-4-androstenediol (3 $\beta$ ,17 $\beta$ -dihydroxyestr-4-ene);
  - (II) 19-nor-4-androstenediol (3 $\alpha$ ,17 $\beta$ -dihydroxyestr-4-ene);
  - (III) 19-nor-5-androstenediol (3 $\beta$ ,17 $\beta$ -dihydroxyestr-5-ene); and
  - (IV) 19-nor-5-androstenediol (3 $\alpha$ ,17 $\beta$ -dihydroxyestr-5-ene);
- (xxxvi) norandrostenedione:
- (I) 19-nor-4-androstenedione (estr-4-en-3,17-dione); and
  - (II) 19-nor-5-androstenedione (estr-5-en-3,17-dione);
- (xxxvii) norbolethone (13 $\beta$ ,17 $\alpha$ -diethyl-17 $\beta$ -hydroxygon-4-en-3-one);
- (xxxviii) norclostebol (4-chloro-17 $\beta$ -hydroxyestr-4-en-3-one);
- (xxxix) norethandrolone (17 $\alpha$ -ethyl-17 $\beta$ -hydroxyestr-4-en-3-one);
- (xl) normethandrolone (17 $\alpha$ -methyl-17 $\beta$ -hydroxyestr-4-en-3-one);
- (xli) oxandrolone (17 $\alpha$ -methyl-17 $\beta$ -hydroxy-2-oxa-[5 $\alpha$ ]-androstan-3-one);
- (xlii) oxymesterone (17 $\alpha$ -methyl-4,17 $\beta$ -dihydroxyandrost-4-en-3-one);
- (xliii) oxymetholone (17 $\alpha$ -methyl-2-hydroxymethylene-17 $\beta$ -hydroxy-[5 $\alpha$ ]-androstan-3-one);
- (xliv) stanozolol (17 $\alpha$ -methyl-17 $\beta$ -hydroxy-[5 $\alpha$ ]-androst-2-eno[3,2-c]-pyrazole);
- (xlv) stenbolone (17 $\beta$ -hydroxy-2-methyl-[5 $\alpha$ ]-androst-1-en-3-one);
- (xlvi) testolactone (13-hydroxy-3-oxo-13,17-secoandrosta-1,4-dien-17-oic acid lactone);
- (xlvii) testosterone (17 $\beta$ -hydroxyandrost-4-en-3-one);
- (xlviii) tetrahydrogestrinone (13 $\beta$ ,17 $\alpha$ -diethyl-17 $\beta$ -hydroxygon-4,9,11-trien-3-one);
- (xlix) trenbolone (17 $\beta$ -hydroxyestr-4,9,11-trien-3-one);

and any salt, ester, or ether of a drug or substance described in this list.

## **Selected Intelligence Brief**

### **Supreme Court Confirms That a Dog Sniff of a Car During a Traffic Stop is not a Fourth Amendment Search**

**Jayme Walker Holcombe**  
Associate Chief Counsel  
Legal Instruction Section  
U.S. Drug Enforcement Administration  
Quantico, Virginia

[From *The Police Chief* 2005;72(3):8  
Unclassified, Reprinted with Permission.]

A dog sniff of an inanimate object that law enforcement officers have lawfully seized is not a search within the meaning of the Fourth Amendment. The U.S. Supreme Court once again confirmed this principle in the Court's recent decision of *Illinois v. Caballes*. [1] In *Caballes* the Court addressed the use of a narcotics-detection dog to sniff a car during the course of a traffic stop. In a 6-2 vote overturning the judgment of the Illinois Supreme Court, the U.S. Supreme Court stated that a "dog sniff conducted during a concededly lawful traffic stop that reveals no information other than the location of a substance that no individual has any right to possess does not violate the Fourth Amendment." [2]

#### **The Traffic Stop**

In *Caballes* an Illinois state trooper stopped the defendant for speeding. After the trooper informed the dispatcher that he was making the stop, another trooper who heard the radio transmission immediately went to the location of the stop with his narcotics-detection dog. The trooper who made the traffic stop had not requested the assistance of the canine unit.

When the canine unit arrived at the scene, the defendant's car was parked on the shoulder of the highway. The defendant was sitting in the car of the trooper who had pulled him over for the traffic violation and that trooper was still writing him a warning ticket. The second trooper walked his dog around the defendant's car. The dog quickly alerted to the defendant's trunk. The troopers searched the trunk and found marijuana inside. The U.S. Supreme Court specifically noted that the "entire incident lasted less than 10 minutes." [3]

The trial court denied the defendant's motion to suppress and found the defendant guilty after a bench trial. The trial court sentenced the defendant to a \$256,136 fine and 12 years' imprisonment. The appellate court affirmed. The Illinois Supreme Court reversed the judgments of the lower courts and concluded that the use of the dog in the case unjustifiably expanded the scope of the traffic stop without the requisite level of suspicion to suggest drug activity.

#### **The Dog Sniff**

In *Caballes* the U.S. Supreme Court agreed to review the case [4] to address the narrow question of "whether the Fourth Amendment requires reasonable, articulable suspicion to justify using a drug-detection dog to sniff a vehicle during a legitimate traffic stop." [5] Because the Court proceeded under the assumption that the trooper who walked the dog around the car had no information about the defendant other than that he had been stopped for speeding, the Court omitted any reference to any facts about the defendant that may have been suspicious.



The Court found that the trooper's stop of the defendant for speeding was a concededly lawful seizure based on probable cause. The Court stated, however, that it "is nevertheless clear that a seizure that is lawful at its inception can violate the Fourth Amendment if its manner of execution unreasonably infringes interests protected by the Constitution." [6] The Court explained that a traffic stop could become unlawful if the seizure is justified only by the interest in issuing a warning ticket and it "is prolonged beyond the time reasonably required to complete that mission." [7]

The U.S. Supreme Court took issue with the Illinois Supreme Court's position that the canine sniff outside of the defendant's car made the initially lawful stop for the speeding violation an unlawful seizure. The Illinois Supreme Court had expressed the view that the use of the dog without any reasonable suspicion that the defendant's car contained narcotics converted the police-citizen encounter from the traffic stop into a drug investigation. In considering this issue, the U.S. Supreme Court stated:

*"In our view, conducting a dog sniff would not change the character of a traffic stop that is lawful at its inception and otherwise executed in a reasonable manner, unless the dog sniff itself infringed respondent's constitutionally protected interest in privacy. Our cases hold that it did not."* [8]

The U.S. Supreme Court cited a number of its prior decisions in reaching the conclusion that the use of the dog in *Caballes* did not violate the Fourth Amendment. For example, the court cited the 1984 case of *United States v. Jacobsen*. [9] The *Jacobsen* case involved a Drug Enforcement Administration (DEA) agent who opened a damaged package containing four plastic bags of white powder concealed in a tube initially opened by employees of an overnight delivery company. The agent removed a trace amount of the powder from one of the bags, conducted a field test, and determined the substance to be cocaine. The Court concluded: "A chemical test that merely discloses whether or not a particular substance is cocaine does not compromise any legitimate interest in privacy." [10] Citing to *Jacobsen*, the Court in *Caballes* stated: "Official conduct that does not 'compromise any legitimate interest in privacy' is not a search subject to the Fourth Amendment." [11]

The Court also mentioned *United States v. Place* [12] and *Indianapolis v. Edmond* [13], two prior U.S. Supreme Court cases that addressed narcotics-detection dog sniffs. The 1983 case *United States v. Place* involved the exposure of a temporarily detained piece of luggage to a narcotics-detection dog. In *Place* agents seized Place's bag and, 90 minutes later, submitted it to a canine sniff. The Court found the initial seizure of Place's luggage legitimate based on a reasonable suspicion that it contained contraband. However, the Court proceeded to find that the length of the detention of the bag, standing alone, constituted a Fourth Amendment violation in the absence of probable cause. After stating that a person has a privacy interest protected by the Fourth Amendment in the contents of luggage, the Court concluded that the exposure of the luggage to a canine sniff did not constitute a search. The Court stated:

*"A 'canine sniff' by a well-trained narcotics-detection dog, however, does not require opening the luggage. It does not expose noncontraband items that otherwise would remain hidden from public view, as does, for example, an officer's rummaging through the contents of the luggage. Thus, the manner in which the information is obtained through this investigative technique is much less intrusive than a typical search. Moreover, the sniff discloses only the presence or absence of narcotics, a contraband item. Thus, despite the fact that the sniff tells the authorities something about the contents of the luggage, the information obtained is limited. This limited disclosure also ensures that the owner of the property is not subjected to the embarrassment and inconvenience entailed in less discriminate and more intrusive investigative methods."* [14]

In *City of Indianapolis v. Edmond* officers walked a narcotics-detection dog around cars stopped at a narcotics checkpoint established by police. Although the Court found that the checkpoints violated the Fourth Amendment, the Court stated the following with respect to the canine sniffs:

*“The fact that officers walk a narcotics-detection dog around the exterior of each car at the Indianapolis checkpoints does not transform the seizure into a search. Just as in Place, an exterior sniff of an automobile does not require entry into the car and is not designed to disclose any information other than the presence or absence of narcotics. Like the dog sniff in Place, a sniff by a dog that simply walks around a car is ‘much less intrusive than a typical search.’”* [15]

Reaffirming this principle in *Caballes*, the Court stated that it had previously treated a narcotics-detection dog sniff as unique “because it ‘discloses only the presence or absence of narcotics, a contraband item.’” [16]

In *Caballes* the Court found it significant that the second trooper walked the dog around the outside of the defendant's car while he was lawfully seized for speeding. The Court stated: “Any intrusion on respondent's privacy expectations does not rise to the level of a constitutionally cognizable infringement.” [17] This is consistent with the previous positions taken by the Court in both *Place* and *Edmond*. The Court also stated that there was no evidence or findings in the record to support the defendant's argument that dog alert error rates call into question whether narcotics-detection canines only alert to contraband.

The Court ended its short opinion in *Caballes* with a discussion of its 2001 decision in *Kyllo v. United States*. [18] In *Kyllo* the court ruled that “the use of a thermal-imaging device to detect the growth of marijuana in a home constituted an unlawful search.” [19] The *Kyllo* Court had been concerned about using a device to detect lawful activity taking place in a person's home. The Court distinguished the *Caballes* decision from *Kyllo* by specifically stating: “The legitimate expectation that information about perfectly lawful activity will remain private is categorically distinguishable from respondent's hopes or expectations concerning the nondetection of contraband in the trunk of his car.” [20]

### Summary

The holding in *Caballes* is a narrow one, but the case provides important guidance for law enforcement. Following the logic of the *Caballes* majority, the Court confirmed that there is no legitimate privacy interest in contraband. Because a dog sniff by a well-trained narcotics-detection dog is likely to disclose only the presence or absence of a contraband item, that sniff is not a Fourth Amendment search when done during a lawfully made and ongoing traffic stop. The Court has confirmed, once again, the principle that once the police lawfully seize an item, the use of a narcotics-detection dog to sniff the item without a search warrant or other applicable exception to the search warrant requirement does not transform the seizure into an unlawful search.

It also should be noted that the Court stated that an initially lawful seizure could be transformed into an unlawful seizure if “its manner of execution unreasonably infringes interests protected by the Constitution.” [21] If a narcotics-detection dog sniff were conducted during an unlawful detention, the Court implied that the use of the dog and any resulting discovery of contraband would be found to constitute the product of an unlawful seizure. [22] Because of the narrowness of the Court's decision in *Caballes*, officers should continue to consult with their legal advisors regarding the use of narcotics-detection dogs during traffic stops and in other investigative situations and contexts. [23]

1. 125 S. Ct. 834, 2005 WL 123826 (U.S.).
2. Id. at 838, 2005 WL 123826 at \*3.

3. Id. at 835, 2005 WL 123826 at \*1.
4. 541 U.S. 972 (2004).
5. 125 S. Ct. 834, 2005 WL 123826 (U.S.).
6. Id. at 835, 2005 WL 123826, at \*1.
7. Id. at 837, 2005 WL 123826, at \*2.
8. Id.
9. 466 U.S. 109 (1984).
10. Id. at 123.
11. 125 S. Ct. 834, 2005 WL 123826 (U.S.).
12. 462 U.S. 696 (1983).
13. 531 U.S. 32 (2000).
14. 462 U.S. 696, 707 (1983).
15. 531 U.S. 32, 40 (2000).
16. 125 S. Ct. 834, 837, 2005 WL 123826 at \*2 (U.S.).
17. Id. at 838, 2005 WL 123826, at \*3.
18. 533 U.S. 27 (2001).
19. 125 S. Ct. 834, 838, 2005 WL 123826 at \*3 (U.S.).
20. Id.
21. Id. at 837, 2005 WL 123826, at \*2.
22. Id.
23. For additional information regarding these issues see: Jayme S. Walker "Using Drug Detection Dogs - An Update," FBI Law Enforcement Bulletin, April 2001, 25.

\* \* \* \* \*

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[Notes: Selected references are a compilation of recent publications of presumed interest to forensic chemists. Unless otherwise stated, all listed citations are published in English. Listed mailing address information (which is sometimes cryptic or incomplete) exactly duplicates that provided by the abstracting services. Patents are reported only by their *Chemical Abstracts* citation number.]

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\* \* \* \* \*

## THE DEA FY - 2005 AND FY-2006 STATE AND LOCAL FORENSIC CHEMISTS SEMINAR SCHEDULE

The remaining FY - 2005 schedule for the DEA's State and Local Forensic Chemists Seminar is as follows:

July 11 - 15, 2005  
September 19 - 23, 2005

The FY-2006 schedule is as follows:

November 14 - 18, 2005  
February 6 - 10, 2006  
May 8 - 12, 2006  
July 10 - 14, 2006  
September 11 - 15, 2006

Note that the school is open only to forensic chemists working for law enforcement agencies, and is intended for chemists who have completed their agency's internal training program and have also been working on the bench for at least one year. There is no tuition charge for this course. The course is held at the AmeriSuites Hotel in Sterling, Virginia (near the Washington/Dulles International Airport). A copy of the application form is reproduced on the last page of the August 2004 issue of *Microgram Bulletin*. Completed applications should be mailed to the Special Testing and Research Laboratory (Attention: Pam Smith or Jennifer Kerlavage) at: 22624 Dulles Summit Court, Dulles, VA 20166. For additional information, call 703/668-3337.

\* \* \* \* \*

## SCIENTIFIC MEETINGS

**1. Title:** 17th Triennial Meeting of the International Association of Forensic Sciences (IAFS) (Second Bimonthly Posting)  
**Sponsoring Organization:** International Association of Forensic Sciences  
**Inclusive Dates:** August 21 - 26, 2005  
**Location:** Hong Kong Convention and Exhibition Centre (Hong Kong)  
**Contact Information:** See Website  
**Website:** [www.iafs2005.com](http://www.iafs2005.com)

**2. Title: 15th Annual CLIC Technical Training Seminar**

(First Monthly Posting)

**Sponsoring Organization:** Clandestine Laboratory Investigating Chemists Association

**Inclusive Dates:** September 7 - 10, 2005

**Location:** St. Louis, MO

**Contact Information:** O. Carl Anderson, Kansas Bureau of Investigation, [carl.anderson -at- kbi.state.ks.us](mailto:carl.anderson@kbi.state.ks.us)

**Website:** None

**3. Title: Midwestern Association of Forensic Scientists (MAFS) Annual Fall Meeting**

(First Monthly Posting)

**Sponsoring Organization:** Midwestern Association of Forensic Scientists

**Inclusive Dates:** October 3 - 7, 2005

**Location:** St. Louis, MO

**Contact Information:** Bryan Hampton, [bhampton -at- saintcharlescounty.org](mailto:bhampton@stcharlescounty.org)

**Website:** None

\* \* \* \* \*

# Computer Corner

ASCLD/LAB-*International* Accreditation - What's New?

## #194

by Michael J. Phelan  
DEA Digital Evidence  
Laboratory

The American Society of Crime Laboratory Directors / Laboratory Accreditation Board (ASCLD/LAB) was established in 1981, and has been accrediting crime laboratories in the United States and many other countries since its inception. Approximately 300 crime laboratories have been accredited over the last 24 years. Accreditation is a quality assurance process that has as its goals to: 1) Improve the quality of laboratory services; 2) develop and maintain standards which can be used to assess a laboratory's level of performance; 3) provide independent, impartial, and objective reviews of laboratory operations and quality control; and 4) provide the public with a recognizable means to identify laboratories that meet ASCLD/LAB standards. The original program was based upon a set of approximately 140 standards that covered laboratory administration, evidence handling, quality assurance, and examination practices. ASCLD/LAB currently offers accreditation in many forensic disciplines, including controlled substances, firearms and tool marks, latent fingerprints, DNA, toxicology, trace evidence, questioned documents, and crime scene analysis. In 2003, ASCLD/LAB recognized the discipline of digital evidence, with four

sub-disciplines: Computer forensics, audio analysis, video analysis, and digital imaging analysis.

In 2004, ASCLD/LAB began to offer a second accreditation program based upon the requirements of International Organization on Standards (ISO) 17025 (1999 general requirements for the competence of testing), supplemented by the 2003 ASCLD/LAB-Legacy program and the International Laboratory Accreditation Cooperative's November 2002 Guidelines for Forensic Sciences (ILAC G-19). This second accreditation program is known as the ASCLD/LAB-*International* accreditation program.

The DEA Digital Evidence Laboratory was accredited by ASCLD/LAB in February, 2005, becoming the first to be accredited under the new *International* program.

The DEA Laboratory system's experience with the ASCLD/LAB-*International* assessment process has been very positive. In retrospect, DEA's Digital Evidence Laboratory clearly benefitted from a complete review of all operating and quality control practices. This has improved the work product, the work process, supporting documentation, and

quality control infrastructure. It has also provided direction for future laboratory management activities and initiatives because accreditation is not a static, one-time achievement, but rather an ongoing process that requires continual effort to maintain the required standards.

The *International* program has much in common with the original accreditation program. The similarities include examination best practices, examination controls (positive and negative), evidence handling and control, examiner proficiency testing (external and internal), examiner training, new examiner qualification testing, instrument monitoring, tool validation, laboratory security, the laboratory facility (facilities), and laboratory administration issues.

The *International* program is based on the need for laboratories to have well documented operating and quality assurance policy and procedures. Much of the assessment is based upon a laboratory's ability to demonstrate conformance to its own standard operating procedures and quality assurance policies and procedures.

The *International* assessment for forensic laboratories involves approximately 300 criteria.

Most of these criteria apply to digital evidence laboratories. The *International* program requires 100 percent compliance with all relevant criteria in order to be accredited. Conforming to all criteria is a challenge, but it is achievable if sufficient time, resources, and upper management support are provided.

The original ASCLD/LAB program has a total of 145 potential criteria. Most apply to digital evidence. Criteria that are designated “essential” (by ASCLD/LAB) require 100 percent compliance. Additionally, criteria that are designated as “important” must have at least 75 percent compliance in order to be accredited. Similarly, criteria that are designated as “desirable” must have at least 50 percent compliance. ASCLD/LAB currently offers accreditation using either the original program criteria or the recently approved *International* criteria.

It is important to understand that the role of the ASCLD/LAB original program Inspector and ASCLD/LAB-*International* Assessor are different. The Inspector is tasked with evaluating compliance with the published ASCLD/LAB standards. The Assessor is tasked with assessing laboratory policies and procedures and laboratory conformance. Under the *International* program (using ISO methodologies), the burden of proof is placed on the Assessor to demonstrate non-conformance by the laboratory. This is a subtle but

important point, and it manifests itself in the required supporting documentation that ASCLD/LAB-*International* laboratories must have in order for the Assessors to perform their job.

There are three principal differences between *International* and the original accreditation programs. First, the *International* program requires substantially more policy and procedure documentation of most aspects of laboratory operations and quality assurance. Second, there is greater emphasis placed on customer needs and requirements. Third, there is more emphasis on standards and reference collection documentation (i.e., that they should be traceable and controlled). A fourth area dealing with quantitative measurement uncertainty is also emphasized, but it is not applicable to the digital evidence discipline at this time.

The DEA Digital Evidence Laboratory approached the accreditation challenge by first reviewing all assessment criteria and determining how the requirements apply to digital evidence. Many of the criteria are articulated using generic ISO laboratory testing and calibration language, and are therefore more easily interpreted if the terms “digital analysis laboratory” or “forensic laboratory” are substituted for the term “testing laboratory.” As previously noted, there are special requirements for calibration laboratories, but they are not applicable to digital evidence

examination laboratories.

The DEA Digital Evidence Laboratory was fortunate to be able to write its standard operating procedures and quality assurance manual with *a priori* knowledge of the *International* and Legacy criteria. It is important that all criteria be addressed in either the laboratory’s standard operating procedures or quality control systems. In fact, laboratory management will have to provide (in advance of the actual assessment visit) policy and procedural references, and supporting documentation showing how the laboratory conforms to each criteria.

The effort to prepare for an ASCLD/LAB accreditation assessment visit is substantial. It took DEA’s Digital Evidence Laboratory many work-months of effort to prepare. It is recommended that any laboratory considering accreditation: 1) Secure top management support; 2) familiarize themselves with the ASCLD/LAB criteria; 3) designate a Quality Assurance Manager as soon as possible to begin to assemble the needed supporting documentation and operating procedures; 4) meet with management personnel from other digital evidence laboratories that have successfully completed the ASCLD/LAB accreditation process and learn from their experiences; 5) consider having an outside pre-inspection conducted prior to the scheduled inspection date to identify weakness or deficiencies; 6) correct all identified

deficiencies; and 7) anticipate that there will be some corrective action responses needed based upon the assessment team's formal visit.

Deficiencies under the *International* program are categorized at two Levels, designated as Levels I and II. A Level I finding (referred to as a non-conformity) directly affects and has a fundamental impact on the work product of the laboratory, or on the integrity of the evidence. For example, a deficiency in evidence handling or an examination protocol could result in a Level I finding. A Level II non-conformity does not, to any significant degree, affect the fundamental reliability of the work product of the laboratory or on the integrity of the evidence. Examples of Level II findings include concern over the supporting file system organization or in the level of detail of the supporting documentation. Additional comments that suggest improvements or recommendations regarding laboratory practices (but which do not constitute a finding of non-conformity or have a bearing on accreditation) may also be made. All non-conformities (including all corrective action responses) are presented to the laboratory director at the conclusion of the assessment visit in a Summary Assessment Conference. A formal full assessment report (reviewed by ASCLD/LAB) is completed within 15 days of the Summation Assessment Conference and provided to the laboratory.

Every laboratory is given a fixed period of time to correct all deficiencies identified in the assessment visit. All Level I non-conformities must be corrected within 180 days of the assessment summation conference, and must be corrected before the lead assessor may make a recommendation for a laboratory to be accredited. All Level II non-conformities must be corrected before the next annual surveillance visit. DEA's Digital Laboratory had eight non-conformities identified, all of which were corrected within 60 days.

ASCLD/LAB-*International* accreditation is granted for five years from the date that the ASCLD/LAB Board of Directors accepts the recommendation of the Lead Assessor. Each accredited laboratory must continuously maintain the ASCLD/LAB standards and satisfy the requirement to successfully have an annual "surveillance" visit conducted by an ASCLD/LAB approved ISO assessor. Other required compliance monitoring techniques include completion of an annual audit accreditation report, and submission of proficiency testing reports by approved test providers must be submitted annually.

Digital evidence laboratory accreditation is a relatively new forensic science initiative. ASCLD/LAB recognized the discipline of Digital Evidence in July, 2003. It is recommended that all organizations that are considering accreditation design their operating and quality

control programs using the ASCLD/LAB-*International* criteria. The additional level of effort and time on the part of laboratory staff and management will gain international recognition of the program's work product. A global world requires a global work product that meets global standards.

Questions or comments?:  
E-mail: [Michael.J.Phelan-at-usdoj.gov](mailto:Michael.J.Phelan-at-usdoj.gov)

# Microgram

## *Bulletin*

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**VOL. XXXVIII, NO. 6**

**JUNE 2005**

**- INTELLIGENCE ALERT -**

**HEROIN SATURATED PAPER FOUND IN A SUITCASE LINING  
IN CAMERON COUNTY, TEXAS**

The Texas Department of Public Safety Crime Laboratory in McAllen (McAllen, Texas) recently received a black leather ["Designer" label] suitcase, suspected to contain cocaine or heroin (see Photo 1). The suitcase was seized by Cameron County Drug Enforcement Task Force Agents from a vehicle enroute from Mexico to Houston on U.S. Route 77 (Cameron County is the southernmost point of Texas). Each side of the suitcase and the middle vinyl divider had a posterboard casing sewn inside the vinyl lining (see Photos 2 and 3, next page). Each casing contained 4 sheets of thick paper (total net mass of the impregnated paper 5.65 pounds). Analysis by GC/MS and GC confirmed 60 percent heroin (salt form not determined; calculated as heroin base). This was the first submission of this type to the McAllen Laboratory.



**Photo 1**





Photo 2



Photo 3

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**- INTELLIGENCE ALERT -**

**LSD MIMIC BLOTTER PAPER IN NORTHERN NEW JERSEY CONTAINING  
5-METHOXY-*ALPHA*-METHYLTRYPTAMINE**

The DEA Northeast Laboratory (New York, New York) recently received a sheet of apparent LSD "blotter acid" (see Photo 4). The exhibit was seized in northern New Jersey by agents from the DEA Newark Field Division. The sheet was 1 inch by 6.25 inches long, had a classic "psychedelic squares" design, and was perforated into a total of 100 squares (all typical of LSD blotter paper). Analysis of the paper (total net mass 1.0 gram) by color testing (acidified Erlich's), TLC, GC/MS, and LC/MS, however, indicated not LSD but rather 5-methoxy-*alpha*-methyltryptamine (5-MeO-AMT) (not quantitated). This is the first submission of 5-MeO-AMT on blotter paper to the Northeast Laboratory.

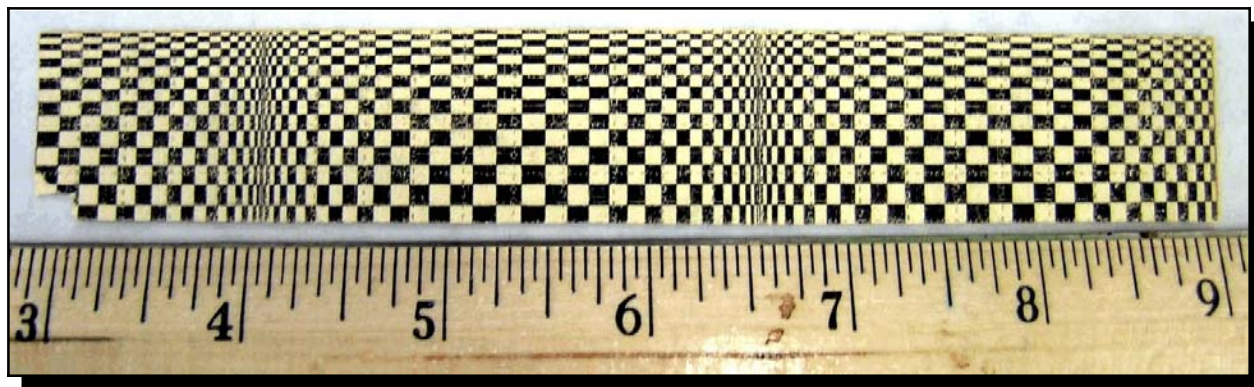


Photo 4

**- INTELLIGENCE ALERT -**

**COCAINE SMUGGLED IN A GRANOLA BOX IN EL PASO, TEXAS**

The DEA South Central Laboratory (Dallas, Texas) recently received two paper cartons, each wrapped in plastic and brown tape, labeled in Spanish as “100% Natural Granola”, and each containing a compressed white powder in a clear plastic bag, suspected cocaine (see Photo 5). The exhibits were seized from an individual in El Paso by U.S. Immigration and Customs Enforcement (ICE) agents (further details unavailable). Analysis of the powder (total net mass 1849 grams) by GC/MS, FTIR, and HPLC confirmed 19 percent cocaine hydrochloride, cut with inositol. This is believed to be the first such submission of cocaine in a granola box to the laboratory.



**Photo 5**

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**- INTELLIGENCE ALERT -**

**RAW OPIUM FORMED INTO PIECES OF CHOCOLATE AT LAX**

The DEA Southwest Laboratory (Vista, California) received an exhibit consisting of 225 pieces of apparent chocolate candies with a strong, distinctive opium odor, suspected opium. The “chocolates” were in four different shapes (see Photo 6), and were packaged in three boxes (it was unknown if the boxes were further wrapped to suppress the odor). The boxes were seized by Immigration and Customs Enforcement (ICE) personnel from the suitcase of a passenger arriving at Los Angeles International Airport (LAX) from Iran, via Germany. Analysis of the “chocolates” (total net mass 1886 grams) by GC-FID and GC/MS identified morphine, codeine, papaverine, thebaine, and noscapine (not quantitated), confirming opium. This was the first such submission to the Southwest Laboratory.

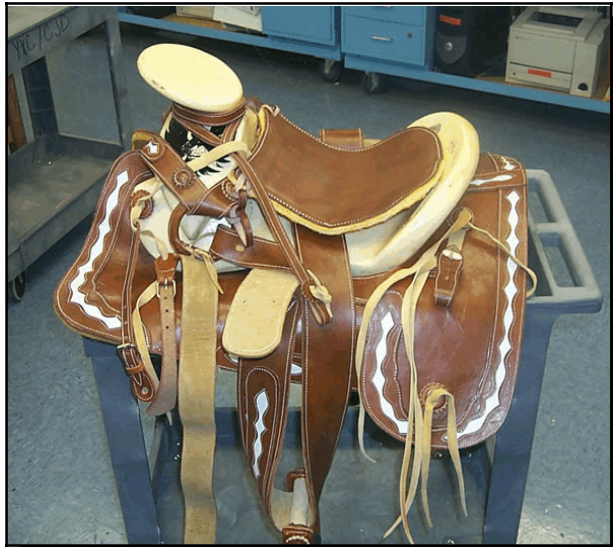


**Photo 6**

**- INTELLIGENCE ALERT -**

**COCAINE SMUGGLED IN A HORSE SADDLE IN TAMPA, FLORIDA**

The DEA Southeast Laboratory (Miami, Florida) recently received a highly decorated saddle containing six packages of white powder, suspected cocaine (see Photo 7). The saddle was first identified by Immigration and Customs Enforcement personnel in Tampa, Florida, but was seized in Erlanger, Kentucky following a controlled delivery (the origin of the saddle was not reported). The bags were hidden within a hollowed out portion of the saddle frame (see Photos 8 and 9). Analysis of the powder (total net mass 1985 grams) by GC/MS and FTIR confirmed 76 percent cocaine hydrochloride. This was the first saddle seizure received by the laboratory in recent memory.



**Photo 7**



**Photo 8**



**Photo 9**

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**- INTELLIGENCE ALERT -**

**MULTI-INGREDIENT COLD MEDICINES USED  
TO PRODUCE METHAMPHETAMINE**

[From the NDIC *Narcotics Digest Weekly* 2005;4(17):1  
Unclassified, Reprinted with Permission.]

Forensic chemists at the Washington State Patrol (WSP) Crime Laboratory in Marysville, supported by a grant awarded by the National Institute of Justice, recently proved that various over-the-counter, multi-ingredient cold medicines can be used to produce methamphetamine.



Many of these medicines are exempt from state pseudoephedrine legislation based in part on the mistaken belief that they cannot be used in methamphetamine production. The steps necessary for methamphetamine producers to extract pseudoephedrine from multi-ingredient products are not excessively complicated but are more difficult than those used for products in which pseudoephedrine is the only active ingredient. WSP chemists extracted pseudoephedrine from the following types of products and used them in a series of small-scale, iodine/red phosphorus methamphetamine production cycles:

- \* Caplets, such as severe cold formulas
- \* Powders, such as those that are dissolved in hot liquids
- \* Water-based liquids, such as cough syrups
- \* Alcohol-based liquids, such as nighttime cough syrups
- \* Softgels

NDIC Comment: Methamphetamine producers in many regions of the country have used liquid cold medicines and multi-ingredient tablets successfully, according to information gathered from law enforcement agencies by NDIC Field Program Specialists (FPSs). Further, forensic chemists frequently discover antihistamines and other products in methamphetamine samples, which indicate that multi-ingredient cold medications often are used as a source of pseudoephedrine. Because legislation has been proposed and/or enacted in over a dozen states restricting the sale of pseudoephedrine but exempting multi-ingredient medications, methamphetamine producers in those states increasingly will use multi-ingredient medications.

[Editor's Note: There has been a surprising amount of misinformation concerning the possibility of extracting pseudoephedrine from liquid pharmaceuticals. In fact, and as the above study proves, such extractions are trivially accomplished.. For a related study performed by McNeil Consumer and Specialty Pharmaceuticals (a major manufacturer of OTC pseudoephedrine-containing products), see page 102.]

\* \* \* \* \*

### **- INTELLIGENCE ALERT -**

#### **MARIJUANA SEIZED AT INDUSTRIAL STORAGE YARD IN HOUSTON, TEXAS**

[From the NDIC *Narcotics Digest Weekly* 2005;4(17):4  
Unclassified, Reprinted with Permission.]

On March 13, 2005, ICE agents in Houston seized over 13,000 pounds of marijuana as a result of a multiagency investigation. Law enforcement authorities allege that the marijuana in this seizure is linked to a large-scale DTO that distributes drugs from Houston to other drug markets throughout the country. ICE agents discovered the marijuana concealed in two tractor-trailers parked in a storage yard in Galena Park, which is located near the Houston Ship Channel. A search of the first tractor-trailer led to the discovery of 9,100 pounds of marijuana; a search of the second truck uncovered an additional 4,268 pounds of the drug. The marijuana was

concealed in drywall compartments and flatbed liners of the trucks. Officials have arrested one suspect in connection with this seizure. The DEA, Harris County Sheriff's Office, and Houston and Pasadena Police Departments are participating in the investigation.

NDIC Comment: DTOs commonly target locations such as storage yards to store and transship illicit drug shipments destined for Houston drug markets as well as for redistribution to cities throughout the United States. Galena Park is largely an industrial area with easy access to Interstate 10 and U.S. Highway 59, which provide traffickers with a direct route to drug markets in the Midwest and Southeast and connectivity to the Mid-Atlantic region. Industrial areas typically include security fencing and warehouses large enough to store commercial vehicles and allow traffickers to transship large shipments within a private commercial facility. Moreover, these locations often are separated from neighboring businesses and residential areas, allowing traffickers to operate without attracting attention.

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### **- INTELLIGENCE ALERT -**

#### **FOUR-STATE ROAD TRIP TO PURCHASE PSEUDOEPHEDRINE INTERRUPTED**

[From the NDIC *Narcotics Digest Weekly* 2005;4(19):1

Unclassified, Reprinted with Permission;

Some Details Withheld in Accordance with *Microgram* Policy.]

On March 22, 2005, a senior investigator with the New Ulm (Minnesota) Police Department arrested four subjects and seized 6,738 pseudoephedrine tablets from their vehicle. Security employees at a large retail store in New Ulm reported to New Ulm Police that three individuals had each purchased two packages of pseudoephedrine and then left the store parking lot in a vehicle with Iowa license plates. Acting on this information, a New Ulm Police investigator located and stopped the vehicle, which was occupied by four Caucasians - two males and two females. Two of the subjects who spoke with the investigator indicated that they were from Iowa (Spirit Lake, Spencer, and Milford) and were "casino-hopping" in South Dakota, North Dakota, and Minnesota [but there were inconsistencies in their stories]. Upon further questioning, the driver of the vehicle admitted that she had used methamphetamine in the past but denied that the group was involved in methamphetamine abuse or manufacturing; she refused to grant permission for the investigator to search the vehicle. Based upon his own observations as well as information provided by both the retail store's security department and the subjects, the investigator arrested the four individuals, seized the vehicle, and obtained a warrant to search the vehicle. During the search the investigator found two duffel bags - one, located in the trunk, contained 3,906 loose pseudoephedrine tablets separated into plastic bags by color; the other, located in the back seat, contained 2,832 pseudoephedrine tablets still in blister packs. No methamphetamine manufacturing equipment was found in the vehicle, and the subjects did not appear to be under the influence of the drug. Receipts found in the vehicle gave some indication of the subjects' travel route and their pseudoephedrine purchases, which occurred on March 21 in an unknown town in Iowa and in Sioux Falls (SD) and on March 22 in Fargo (ND) and in Melrose, Cold Spring, and New Ulm. The subjects' stops suggest that they were following a

circuitous route that would have ended at their point of departure in Iowa. All four of the subjects have prior drug convictions and were charged under Minnesota state law with conspiracy to manufacture methamphetamine and attempt to manufacture methamphetamine.

NDIC Comment: The levels of methamphetamine production and abuse in the aforementioned states are high. According to the NDIC National Drug Threat Survey (NDTS) 2004, a large percentage of law enforcement respondents in Iowa (92.7%), South Dakota (100%), North Dakota (96%), and Minnesota (85.3%) consider methamphetamine to be the greatest drug threat in their jurisdictions. In response, state legislatures in the Midwest and West are enacting pseudoephedrine regulations intended to decrease the availability of precursor chemicals used in methamphetamine production. Coincidentally, on the date of this incident the governor of Iowa signed Senate File 169, an act regulating the display and sale of pseudoephedrine; the law will take effect on May 21. South Dakota currently has no point-of-sale regulations on ephedrine, but on July 1 a law restricting the sale and purchase of products containing pseudoephedrine and ephedrine will take effect. North Dakota currently has point-of-sale restrictions, which will be strengthened on June 1 when a new methamphetamine precursor law goes into effect. Minnesota currently is considering legislation regarding the sale of pseudoephedrine. The subjects in this case appear to have been aware of the relevant pseudoephedrine regulations along their route and were most likely purchasing limited quantities of pseudoephedrine from various stores along the way in an effort to avoid law enforcement scrutiny.

[Editor's Comments: "Road Trips" to purchase allowable quantities of Over-the Counter (OTC) ephedrine and/or pseudoephedrine-containing products at dozens or even hundreds of stores have been widely predicted, and will certainly become a more common practice as more and more states enact restrictions on displays and sales on such products. The above incident illustrates the large numbers of tablets that can be acquired by this practice - but also illustrates that education and vigilance can be effective in tipping off law enforcement personnel to individuals or groups that are undertaking such trips.]

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### **- INTELLIGENCE ALERT -**

#### **MARYLAND PHYSICIAN CONVICTED FOR CONSPIRACY TO MANUFACTURE MDMA**

[From the NDIC *Narcotics Digest Weekly* 2005;4(19):2  
Unclassified, Reprinted with Permission;  
Some Details Withheld in Accordance with *Microgram* Policy.]

On April 25, 2005, a federal jury in Baltimore convicted a 45-year-old physician for conspiracy to manufacture MDMA (3,4-methylenedioxymethamphetamine, also known as ecstasy) and attempt to manufacture MDMA. Prosecutors argued that the physician conspired to manufacture over 10 kilograms of the drug. The doctor was arrested on January 23, 2004, after a search of two Baltimore residences revealed the presence of a laboratory in one residence and a sealed metal pipe containing green liquid in the oven of his condominium. Forensic laboratory testing



revealed that the liquid, which was in the final stage of MDMA production, contained camphor, methylamine, and safrole. The physician's fingerprints were found on papers describing MDMA production. Investigators also discovered a laboratory manual, drug-packaging paraphernalia, other chemicals (enough to produce at least 35,000 MDMA tablets), and thousands of gelatin capsules--some containing the weight loss drug phentermine, which he allegedly manufactured, although illegally, for his patients. Prosecutors argued that the physician may have begun manufacturing and distributing MDMA after failing to realize large profits from his weight loss clinic. During the trial a Baltimore City narcotics detective described a balance sheet allegedly belonging to the physician that appeared to show more than \$1.3 million in projected sales for MDMA over a 6-month period. The proceeds were to be used to purchase [an expensive sports car], a Caribbean vacation, and a house in Baltimore County. The physician faces a maximum sentence of 20 years in prison and a \$1 million fine on each of the two counts. The physician is scheduled for sentencing on July 29, 2005. His coconspirator, a chemist, pleaded guilty on April 15, 2005, to conspiracy to manufacture MDMA.

NDIC Comment: This case is unique because it involves a physician who attempted to manufacture MDMA for distribution. Most cases in which physicians are involved in drug distribution involve diverted pharmaceuticals. Domestic MDMA production is uncommon. Moreover, MDMA production requires specialized equipment and knowledge, typically demanding an exceptional understanding of chemistry. This physician was very knowledgeable about illicit drugs as he had once worked for the National Institute on Drug Abuse (NIDA) and had published a number of research papers on topics related to illicit drugs. He possessed the requisite skills and equipment to operate an MDMA laboratory.

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#### **- INTELLIGENCE ALERT -**

### **MARIJUANA AND CURRENCY TRANSPORTED IN A HORSE TRAILER IN KANSAS AND MISSOURI**

[From the NDIC *Narcotics Digest Weekly* 2005;4(19):3  
Unclassified, Reprinted with Permission.]

On March 4, 2005, a Kansas Highway Patrol trooper seized \$114,300 concealed in a horse trailer during a traffic violation stop of a pickup truck on Interstate 35 in Lyon County. The New Mexico-registered horse trailer contained two horses. The driver, an Hispanic male from Texas, and a passenger, an Hispanic male from New Mexico, gave the trooper consent to search the vehicle but refused to give consent to search the trailer. The trooper requested a drug-detection canine, which alerted to the horse trailer. Several plastic bags of currency were found under hay and manure on the trailer's floor. A .38 caliber handgun was found under the backseat of the pickup truck. The driver's destination was a racetrack in southern New Mexico. Both men denied ownership of the gun and the currency. They forfeited rights to the money and were released at the scene.

(Continued on Page 101)

On March 25, 2005, officers with the Missouri State Highway Patrol seized 720 pounds of marijuana from an unoccupied horse trailer during a routine violation stop on I-44 in Lawrence County. Commercial motor vehicle officers became suspicious after questioning the driver of the truck that was pulling the trailer. They requested a drug-detection canine, which subsequently alerted to the trailer. A search revealed 18 bales of marijuana concealed in a false compartment located in the front of the trailer. The driver of the vehicle, a Caucasian male from Illinois, stated that he had made approximately 15 similar trips and that horses were not transported on any of these occasions. Troopers arrested the man and the driver of an escort vehicle, also a Caucasian male from Illinois. The men were transporting the marijuana from Texas to Kentucky.

NDIC Comment: The use of horse trailers to transport marijuana and drug proceeds has increased, based on these and other currency and marijuana seizures. Similar marijuana seizures by troopers from the Kansas Highway Patrol include 1,841 pounds seized in December 2004 and more than 1,000 pounds seized in October 2004, both from unoccupied horse trailers on I-35 in Lyon County. Two large currency seizures from horse trailers occurred in 2004, when officers from the Chicago Police Department seized \$835,645 from an occupied three-stall horse trailer destined for Mexico and when a Shelby County (TN) Sheriff's Office deputy seized over \$100,000 from a horse trailer destined for Arizona.

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#### **- INTELLIGENCE ALERT -**

#### **METHAMPHETAMINE DISTRIBUTORS IN FLORIDA USING "DOGGIE BOXES"**

[From the NDIC *Narcotics Digest Weekly* 2005;4(19):4  
Unclassified, Reprinted with Permission.]

Some Caucasian methamphetamine distributors in Charlotte, DeSoto, and Hardee Counties (Florida) are transporting methamphetamine concealed in camouflaged, aluminum 4-inch by 4-inch containers referred to as doggie boxes. According to a DeSoto County Sheriff's Office contact, distributors place a bag containing one-eighth ounce to a few ounces of methamphetamine inside an aluminum box and glue it closed. The exterior of the box is then covered with glue and rolled in loose dirt to give it the appearance of a clump of dirt. If the distributors believe that they are about to be stopped by law enforcement officers, they toss the doggie box out of the car. After the box has been thrown from the vehicle, it usually blends in with the dirt on which it lands, causing difficulty for law enforcement officers attempting to find the box.

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## Selected Intelligence Brief

### LABORATORY ANALYSIS OF THE CONVERSION OF PSEUDOEPHEDRINE TO METHAMPHETAMINE FROM COMMON OVER-THE-COUNTER PRODUCTS

[Special Report from McNeil Consumer and Specialty Pharmaceuticals]

Pseudoephedrine (PSE) is a List 1 chemical present in many over-the-counter (OTC) cold and sinus products. Small clandestine lab operators (street cooks) use OTC PSE products to manufacture illicit methamphetamine. There is limited scientific information on the relative ease and extent of PSE conversion to methamphetamine from OTC products. McNeil Consumer and Specialty Pharmaceuticals sponsored a scientific study, conducted by an independent ASCLD/LAB accredited forensic laboratory, to assess two different approaches to convert PSE to methamphetamine from OTC PSE products.

The first approach involved the extraction of PSE from OTC products followed by conversion to methamphetamine using the Birch ("Nazi") method. The OTC products tested included single and multiple-active products (2-4 actives, all with PSE and an analgesic), and included caplet, tablet, liquid, and liquid-filled softgel forms. The extent of PSE conversion to methamphetamine varied among extracts, and was up to 31% of the PSE present in the starting OTC product. PSE extract conversion to methamphetamine was realized regardless of dosage form (i.e., whether solids, liquids, or liquid-filled softgels).

The second approach was to directly convert PSE to methamphetamine using the Birch method. Materials tested included pure PSE powder, and a combination of PSE plus an analgesic either as a powder mixture or as an OTC caplet. The extent of PSE conversion to methamphetamine ranged from 54% to 68% of the PSE present in the starting material.

These study results provide scientific evidence that PSE from OTC products can be converted to methamphetamine using approaches employed by small clandestine lab operators. The ease and extent of PSE conversion from extracts appears to be independent of the PSE starting quantity, dosage forms, and presence of other actives.

\* \* \* \* \*

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[Notes: Selected references are a compilation of recent publications of presumed interest to forensic chemists. Unless otherwise stated, all listed citations are published in English. Listed mailing address information (which is sometimes cryptic or incomplete) exactly duplicates that provided by the abstracting services. Patents are reported only by their *Chemical Abstracts* citation number.]

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17. Takagi T, Makino Y, Tanaka Y, Okamoto K, Yamashita N, Matsumoto T, Yokota M, Kurokawa K, Yasunaga T. **Application of revised version of neural independent component analysis to classification problems of confiscated methamphetamine.** Chemical and Pharmaceutical Bulletin 2004;52(12):1427. [Editor's Notes: The title technique is presented for profiling and classifying methamphetamine. Contact: Graduate School of Pharmaceutical Sciences, Osaka University, Osaka, Japan 565-0871.]
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## THE DEA FY - 2005 AND FY - 2006 STATE AND LOCAL FORENSIC CHEMISTS SEMINAR SCHEDULE

The remaining FY - 2005 schedule for the DEA's State and Local Forensic Chemists Seminar is as follows:

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## SCIENTIFIC MEETINGS

### 1. Title: 15th Annual CLIC Technical Training Seminar

(Second Monthly Posting)

**Sponsoring Organization:** Clandestine Laboratory Investigating Chemists Association

**Inclusive Dates:** September 7 - 10, 2005

**Location:** St. Louis, MO

**Contact Information:** O. Carl Anderson, Kansas Bureau of Investigation, [carl.anderson@kbi.state.ks.us](mailto:carl.anderson@kbi.state.ks.us)

**Website:** None

### 2. Title: Midwestern Association of Forensic Scientists (MAFS) Annual Fall Meeting

(Second Monthly Posting)

**Sponsoring Organization:** Midwestern Association of Forensic Scientists

**Inclusive Dates:** October 3 - 7, 2005

**Location:** St. Louis, MO

**Contact Information:** Bryan Hampton, [bhampton@saintcharlescounty.org](mailto:bhampton@saintcharlescounty.org)

**Website:** None

\* \* \* \* \*

# Computer Corner

## On-Site Backup Protocols - New Challenges

# #195

by Michael J. Phelan  
DEA Digital Evidence  
Laboratory

Many digital evidence programs provide a dual mission support function, collecting as well as analyzing computer evidence. The collection of digital evidence in the field is commonly referred to as on-site backup.

On-site backup requests are a common occurrence, particularly when businesses or professionals (doctors, lawyers, accountants, etc.) are the subject of the investigation. Courts are increasingly insisting that search warrant language require on-site backups when technically and operationally feasible. In some rare instances, search warrants have been crafted to be extremely limiting requiring that no computer may be shut down, no user disrupted, and all searching completed by a specific time.

The overlapping of the legal and computer forensic domains can create challenges for digital evidence examiners assigned to provide on-site hard drive support.

### **On-Site Support Justification**

The rationale supporting the decision to perform an on-site backup usually involves concerns that the actions of law enforcement will be inordinately disruptive to legitimate businesses that may contain a small amount of potentially

incriminating information, or documentation of overt acts, that are commingled within massive volumes of licit data. Another justification for an on-site collection of digital evidence involves concerns for the community when public assets such as pharmacies, doctor clinics, and even pharmaceutical manufacturers are of interest in the investigation. The removal of entire computer systems or central network servers from these places of business would jeopardize individual safety by (for example) preventing prescriptions being filled/refilled, or interrupting legitimate drug manufacturing. A third concern is the reluctance of the courts to broadly authorize large scale collection of digital information when the potential of a privileged informational relationship may exist that involves doctor-patient or attorney-client information.

### **The New Challenge**

On-site hard drive backup is an effective technical solution to address prosecutor or court concerns. However, digital evidence examiners should consider that the most effective implementation of on-site hard drive backup support requires a comprehensive protocol that encompasses technical, operational, legal, and administrative procedures.

### **Technical**

On-site hard drive backups usually have two primary technical issues. First, computers in most business environments contain such massive amounts of information that the classical computer forensics approach to duplicate every hard drive is often impossible from a practical viewpoint. Therefore, on-site protocols must allow the flexibility to make select copies of needed data such as certain file types (e-mails, financial, documents, spreadsheets, pictures, etc.), databases, files, folders, or hard drive partitions. Second, modern business computer systems are increasingly utilizing complex servers that specialize in front-end web pages, back-end transactional e-commerce business data, and corporate e-mail servers. These computer systems are often hosted on high performance hardware systems (RAIDS, PERC and RISC) that make exporting information outside of the working environment technically difficult. On-site protocols should therefore be supportive of direct solutions involving exporting select raw data or printing the needed data to a file. Often, use of the local computer system to generate data is the most time-effective mechanism when processing a large computer system or network.

### **Operational**

On-site protocols should require that operational constraints be documented and addressed in the digital evidence collection plan. Examples of possible concerns include: 1) A limited scope of investigation; 2) limited time allotted for the search; 3) safety concerns (particularly in manufacturing or laboratory environments), and 4) available personnel. Each constraint can affect the scope of effort and should be discussed with the Case Agent to ensure that the level of support maximizes the opportunity to gather all or at least the most critical investigative information.

### **Legal**

On-site protocols must stay within the legal scope of the search warrant, administrative inspection warrant (if applicable), or owner's consent. The on-site protocol should require that all digital evidence examiners be familiar with the authorizing search document. There may be a need to try to minimize data collection in the field by using only keywords or file type filtering, in order to avoid collecting privileged information. Often, such triaging techniques take additional time by adding to the overall on-site copying time, but they also reduce the amount of data to be examined later on at the laboratory.

### **Administrative**

On-site protocols must not overlook the administrative issues. Since the original evidence is not removed, the technical documentation describing the seized evidence,

forensic techniques and processes used on-site, and examiner notes must be made while on-site. The on-site administrative issues may become complex and require clear documentation. For example, the copy made on-site is a best evidence copy and should be properly annotated. Also, copies of several hard drive exhibits (commonly known as "images") can be placed on a single drive. Multiple exhibits contained (stored) in one physical object may result in evidence recording confusion. Clear and detailed administrative protocols can eliminate most on-site evidence handling and documentation issues.

### **Field Deployment Kits**

Digital Evidence Laboratories also need to have portable equipment to perform on-site digital evidence support. Historically, the equipment taken to the field involves one or more computer systems, hard drive write blockers, a wide assortment of cables, connectors, blank hard drives, and a variety of blank external storage media (CDs, DVDs, diskettes, or tapes). The extensive use of cell phone, Personal Digital Assistant (PDA), and two-way pager devices, has broadened the on-site mission requirements for law enforcement forensics. It is now desirable to also travel with hardware technologies that can download these types of consumer electronic devices. Also, having a portable Subscriber Identity Module (SIM) card reader capability is very useful since SIM cards (more commonly known as

"smart cards") can contain good investigative lead information such as address book entries, user registration information, text messaging, and last call data.

The on-site collection mission is a very important, technical support service that is becoming essential to law enforcement as investigations move beyond individual subjects of interest into corporations. Digital evidence laboratory policies and on-site operating protocols must be sufficiently robust and versatile to provide clear direction on how modern business environments should be handled. The traditional policy to collect and copy everything is not supportable (or desirable) in current commercial or office environments.

Questions or comments?:  
E-mail: [Michael.J.Phelan-usdoj.gov](mailto:Michael.J.Phelan-usdoj.gov)

# Microgram

## Bulletin

Published by:

The Drug Enforcement Administration  
Office of Forensic Sciences  
Washington, DC 20537

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VOL. XXXVIII, NO. 7

JULY 2005

**- INTELLIGENCE ALERT -**

**COCAINE IN A BOOK LINING IN  
HUELVA PROVINCE, SPAIN**

The Stupeficient Control Laboratory of the Health Department (Area de Sanidad) in Seville, Spain recently received a large book containing 96 black colored plastic squares concealed within the front and back covers, each containing an off-white powder, suspected cocaine (see Photo 1, right, and Photo 2, next page). The book was seized by the Guardia Civil/Anti-Narcotics Enforcement Department from normal mail in Huelva Province (southwest Spain). The origin of the mailing was not reported. Analysis of the powder (total net mass 247 grams) by color testing and GC/FID confirmed 38.6 percent cocaine hydrochloride. This was the first submission of this type to the laboratory.

\* \* \* \* \*

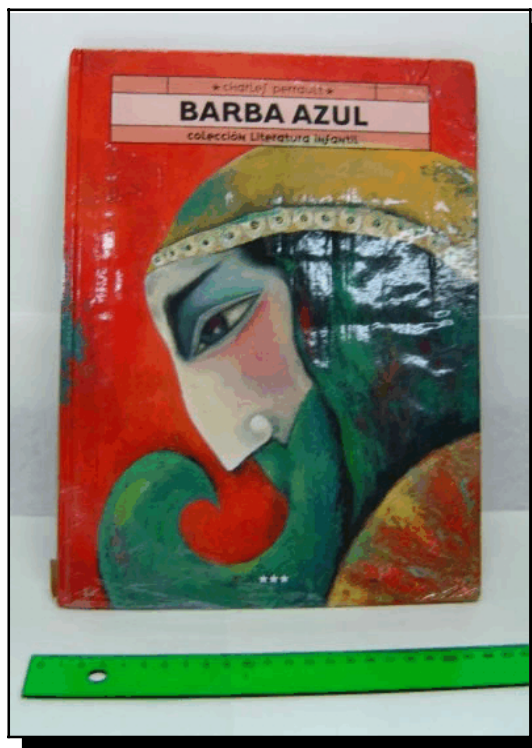


Photo 1



**Photo 2**

\* \* \* \* \*

**- INTELLIGENCE ALERT -**

***MARRUBIUM VULGARE* (WHITE HOREHOUND) SUBMITTED AS  
SUSPECTED MARIJUANA IN SAN FRANCISCO, CALIFORNIA**

The DEA Western Laboratory (San Francisco, California) recently received a professionally labelled plastic cylinder filled with a dry, green plant material, suspected marijuana (see Photo 3, below, and Photos 4 and 5, next page). The exhibit was submitted by the U.S. Marshals Service (San Francisco), and was originally mailed to a U.S. District Court Judge by a former civil



**Photo 3**





Photo 4



Photo 5

litigant, along with a personal note and a copy of a well known, drug use-promoting newspaper/magazine. The plastic cylinder measured approximately 9 x 1 inches, and was labelled as "Skyscraper" by "International Oddities". Initial gross examination indicated that the plant material (total net mass 13.0 grams) superficially resembled marijuana, but without the expected characteristic and distinctive odor. Microscopic examination showed fine white hairs (resembling clothing hairs) on all parts of the material (both sides of leaves, stems, etc.), but no cystolithic hairs. Analysis of petroleum ether extracts by TLC and GC/MS were negative for  $\Delta^9$ -THC. Further analysis of a chloroform:methanol (4:1) extract by GC/MS indicated marrubiine (not confirmed due to the lack of a reference standard), the principal component in *Marrubium vulgare* (also known as White Horehound). Internet research indicated that this material is being marketed as a "tobacco alternative"; however, the company's website descriptions clearly imply that it and similar products are actually legal marijuana alternatives. *Marrubium vulgare* is not controlled, and is not believed to have any abuse potential; it is a traditional (now minor) herb touted as a botanical home remedy as an expectorant, for relief of bronchitis, "chest tightness", and similar maladies. This is believed to be the first such submission to the Western Laboratory.

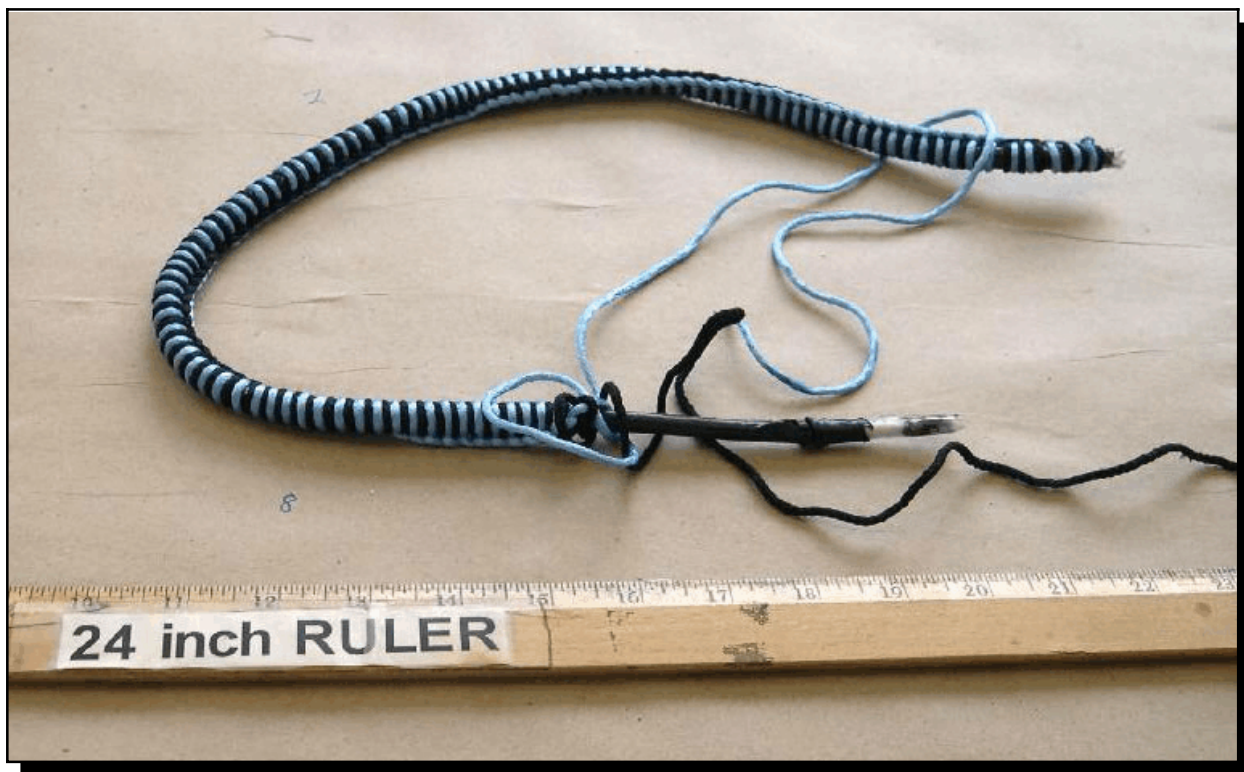
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#### - INTELLIGENCE ALERT -

#### TOTE-BAG HANDLES FROM BOGOTA (CONTAINING HEROIN) IN MIAMI, FLORIDA

The DEA North Central Laboratory (Chicago, Illinois) recently received 58 tote-bag handles, each containing a light tan colored powder, suspected heroin (see Photo 6, next page (displayed





**Photo 6**

oversize to show detail)). The tote-bags originated in Bogota, Colombia, and were seized at the Bureau of Immigration and Customs Enforcement (BICE) mail screening facility in Miami, then submitted to the North Central Laboratory after being forwarded to Detroit, Michigan (possibly for an attempted controlled delivery; actual circumstances of final seizure not reported). The handles (two per bag) had been removed from the tote-bags prior to their submission; the (large) tote-bags themselves were determined to have contained no controlled substances. The powder was contained in plastic tubes, which were further wrapped in black plastic electrical tape, that were in turn wrapped in a braided yarn cover (see the unwrapped (lower) end in Photo 6; note that the yarn colors varied from handle to handle). Analysis of the powder (total net mass 422 grams) by GC, GC/MS, and FTIR confirmed 81 percent heroin hydrochloride. This is the first known submission of this kind in the United States, and no others have been reported since this initial seizure.

\* \* \* \* \*

**- INTELLIGENCE ALERT -**

**QUILTED UNISEX GARMENTS FROM GHANA (CONTAINING HEROIN)  
AT WASHINGTON/DULLES AIRPORT, VIRGINIA**

The DEA Mid-Atlantic Laboratory (Largo, Maryland) recently received a submission of 25 unisex garments with quilted linings in their front panels containing a tan powder within the quilts, suspected heroin (see Photos 7 - 9, next page). The garments were seized by the United



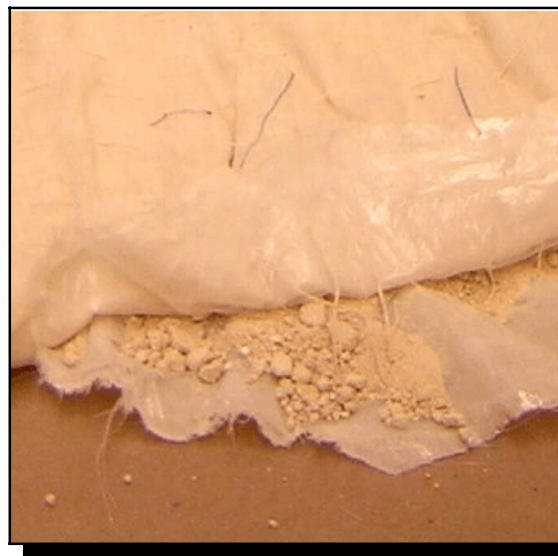
**Photo 7**



**Photo 8**

States Customs Service at the Washington-Dulles International Airport from luggage on a flight that originated from Ghana, Africa. Analysis of the powder (total net mass 4,880 grams) by GC/FID, GC/MS, and FTIR confirmed 47 percent heroin hydrochloride, acetaminophen, and caffeine. The Mid-Atlantic Laboratory previously received a similar submission, in December, 2004.

[Editor's Comments: A variety of quilted clothing containing controlled substances (primarily heroin), including shirts/blouses, pants, and jackets, has been previously reported in *Microgram* and *Microgram Bulletin*. The heroin was "sandwiched" between layers of plastic within the quilting, which is unusual.]



**Photo 9**

\* \* \* \* \*

## **- INTELLIGENCE BRIEF -**

### **METHAMPHETAMINE SUPERLAB SEIZED NEAR BROWNSVILLE, OREGON**

[From the NDIC *Narcotics Digest Weekly* 2005;4(24):1  
Unclassified, Reprinted with Permission.]

On May 26, 2005, the Drug Enforcement Administration (DEA) Salem Resident Office Task Force, along with federal, state, and local law enforcement officers, dismantled a super lab located outside Brownsville, a small town situated just east of Interstate 5 between Salem and

Eugene. The laboratory, which had been in operation for approximately 5 months, was located in a modular home on a rural, wooded, 10-acre property. The site had been under law enforcement surveillance for a short period of time. Ninety pounds of pure methamphetamine could have been produced at this lab in a 48- to 72-hour period. Law enforcement officers seized approximately 3 pounds of methamphetamine as well as 150 pounds of iodine, 20 to 30 pounds of red phosphorus, \$195,000, five vehicles, and seven guns. Fifteen individuals, most of whom were Mexican citizens living in Salem, were arrested in the investigation; to date, five of the 15 were charged in a federal indictment with conspiracy to manufacture methamphetamine.

NDIC Comment: Methamphetamine laboratories in Oregon typically are not super labs - only a few of these large laboratories are discovered each year in the state. DEA officials estimate that 65 percent of all methamphetamine available in the United States is produced in super labs located in the United States or Mexico, which are often operated by Mexican drug trafficking organizations (DTOs). According to 2005 data from the El Paso Intelligence Center (EPIC) National Clandestine Laboratory Seizure System (NCLSS), 36 laboratories were seized in Oregon as of May 13, and only one was a super lab. One pound or less of methamphetamine could have been produced per production cycle in the remaining 35 small laboratories; less than 2 ounces could have been produced per production cycle in 23 of the 35 laboratories.

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## **Selected Intelligence Brief**

### **HERBAL DRUG UPDATE: KRATOM**

[From the NDIC *Narcotics Digest Weekly* 2005;4(16):4  
Unclassified, Reprinted with Permission.]

Some epidemiologists have reported that kratom--an herbal drug derived from a tropical tree native to Southeast Asia--has significant abuse potential in the United States, where it currently is legal. Kratom leaves (fresh and dried) and plants are widely available on the Internet and probably are sold at some "head shops" in the United States. Dried kratom leaves are relatively inexpensive, often selling for \$10 to \$40 per ounce. Kratom users typically chew fresh leaves or make a tea from dried leaves, but some users smoke the dried leaves. Because kratom abuse has been recognized in several regions of Asia, the herb has been made illegal in Australia, Burma, Malaysia, and Thailand.

The primary active alkaloid in kratom is mitragynine; however, other alkaloids are present and account for a variety of effects, which are dose-dependent. Low doses usually produce stimulant effects; higher doses usually produce sedative and euphoric effects. Some users report "lucid dreaming." Effects typically begin within 5 to 10 minutes after ingestion and last approximately 6 hours. Individuals who chronically use kratom become thin, their skin darkens (particularly on the cheeks), and they experience dry mouth, constipation, and frequent urination. Withdrawal symptoms can include muscle and joint pain, hostility, aggression, eye-watering, and spastic limb movements. Users who combine kratom with nervous system depressants may experience respiratory depression, which may cause them to stop breathing.

NDIC Comment: Kratom's wide availability on the Internet suggests that demand is extensive; however, kratom abuse is not monitored by any national drug abuse survey, and NDIC has not yet received law enforcement reports regarding kratom abuse in the United States. Newspaper reports regarding kratom abuse recently were published in Malaysia, similar reports have surfaced in Great Britain, and several web sites - some based in the United States - frequented by recreational drug abusers contain extensive information about kratom. It is likely that kratom abuse is unrecognized in areas where it is occurring because the crushed, dried leaves resemble other plant-based drugs, and the effects mimic effects of other drugs.

One potential user population for kratom is opiate addicts who may attempt to self-treat if they do not have access to methadone programs or if they are reluctant to seek professional treatment. Some medical researchers have speculated that kratom may be useful as a substitute for methadone in treating opiate dependency, although more research is needed.

\* \* \* \* \*

## SELECTED REFERENCES

[Selected references are a compilation of recent publications of presumed interest to forensic chemists. Unless otherwise stated, all listed citations are published in English. Listed mailing address information (which is sometimes cryptic or incomplete) exactly duplicates that provided by the abstracting services. Patents are reported only by their *Chemical Abstracts* citation number.]

1. Brettell TA, Butler JM, Saferstein R. **Forensic science.** Analytical Chemistry 2005;77(12):3839. [Editor's Notes: The latest edition of the authors' biennial reviews. Contact: Office of Forensic Sciences, New Jersey State Police, New Jersey Forensic Science and Technology Complex, Hamilton, NJ 08691.]
2. Cimpoi C. **Qualitative and quantitative analysis by hyphenated HPTLC-FTIR technique.** Journal of Liquid Chromatography & Related Technologies 2005;28(7-8):1203. [Editor's Notes: Includes (unspecified) applications for analysis of drugs. Contact: Faculty of Chemistry and Chemical Engineering, "Babes-Bolyai" University, Cluj-Napoca, Rom.]
3. Galimov EM, Sevastyanov VS, Kulbachevskaya EV, Golyavin AA. **Isotope ratio mass spectrometry:  $\delta^{13}\text{C}$  and  $\delta^{15}\text{N}$  analysis for tracing the origin of illicit drugs.** Rapid Communications in Mass Spectrometry 2005;19:1213. [Editor's Notes: Various techniques are described for determining isotope ratios in heroin, morphine, cocaine, and "hemp". Contact: Vernadsky Institute of Geochemistry and Analytical Chemistry, Russian Academy of Sciences, Kosygin St. 19, Moscow 119991, Russia.]
4. Gosav S, Praisler M, Dorohoi DO, Popa G. **Automated identification of novel amphetamines using a pure neural network and neural networks coupled with principal component analysis.** Journal of Molecular Structure 2005:744 and 821. [Editor's Notes: Amphetamines not specified in the abstract. Contact: Department of Physics, University of Galati, Domneasca St. 47, Galati 6200, Rom.]
5. Lewis R., Ward S, Johnson R, Burns D, Thorburn D. **Distribution of the principal cannabinoids within bars of compressed cannabis resin.** Analytica Chimica Acta

- 2005;538(1-2):399. [Editor's Notes: The results indicate wide variations in CBD, THC, and CBN content across the selected samples, suggesting that a single subsample is not characteristic of the entire sample. A 12 month aging study is included. Contact: Lothian and Borders Forensic Science Laboratory, Edinburgh EH16 6TF.]
6. Pihlainen K, Grigoras K, Franssila S, Ketola R, Kotiaho T, Kostainen R. **Analysis of amphetamines and fentanyl by atmospheric pressure desorption/ionization on silicon mass spectrometry and matrix-assisted laser desorption/ionization mass spectrometry and its application to forensic analysis of drug seizures.** Journal of Mass Spectrometry 2005;40(4):539. [Editor's Notes: Presents the title studies. The amphetamines and fentanyl were not specified in the abstract. Contact: Division of Pharmaceutical Chemistry, Department of Pharmacy, University of Helsinki, Helsinki FIN-00014, Finland.]
  7. Santos AP. **Methamphetamine laboratory explosions: A new and emerging burn injury.** Journal of Burn Care and Rehabilitation 2005;26(3):228. [Editor's Notes: No abstract or contact information was provided.]
  8. Thevis M, Bommerich U, Opfermann G, Schaefer W. **Characterization of chemically modified steroids for doping control purposes by electrospray ionization tandem mass spectrometry.** Journal of Mass Spectrometry 2005;40(4):494. [Editor's Notes: Presents a study of 21 steroids (not specified in abstract, but in the gestrinone, trenbolone, and testosterone series) to elucidate characteristic fragmentation patterns. Contact: Institute of Biochemistry, German Sport University Cologne, Cologne 50933, Germany.]

#### Additional References of Possible Interest:

1. Anonymous. **News in Brief: Lawyers and judges need training in forensic science.** Chemistry & Industry 2005;(7):8. [Editor's Notes: No abstract or contact information was provided.]
2. Hansen DB, Joullie MM. **The development of novel ninhydrin analogues.** Chemical Society Reviews 2005;34(5):408. [Editor's Notes: Focus is on application for detection of latent fingerprints. Contact: Department of Chemistry, University of Pennsylvania, Philadelphia, PA 19104.]
3. Nakai I. **Recent advances and future of X-ray fluorescence.** Oyo Butsuri 2005;74(4):453. [Editor's Notes: A brief history and review. Includes (unspecified) forensic applications. This article is written in Japanese. Contact: Dep. Appl. Chem., Fac. Sci., Tokyo Univ. Sci., Tokyo 162-8601, Japan.]
4. Okano M, Ueki M. **Origin identification of steroids by carbon isotope ratio detection.** Rinsho Kensa 2004;48(7):779. [Editor's Notes: A review. Uses GC/IRMS. Appears to be focused on urinalysis. Steroids not specified in the abstract. This article is written in Japanese. Contact: Doping Lab., Mitsubishi Chemical BCL, Inc., Japan.]
5. Sander LC. **Determination of ephedrine alkaloids in dietary supplement Standard Reference Materials.** Analytical Chemistry 2005;77(10):3101. [Editor's Notes: No abstract or contact information was provided.]

6. Schmitt-Kopplin P, Englmann M. **Capillary electrophoresis - mass spectrometry: Survey on developments and applications 2003-2004.** Electrophoresis 2005;26(7-8):1209. [Editor's Notes: An update on a previous published review by the authors (Electrophoresis 2003;24:3837). Contact: Institute of Ecological Chemistry, GSF - National Research Center for Environment and Health, Neuherberg, Germany.]

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## THE JOURNAL/TEXTBOOK COLLECTION EXCHANGE

There is one offering for this quarter:

The *New York Times*, 1974 - 1992 (35 mm microfilm). First Come/First Serve; no charge to requestor. Provide full mailing address in request.

**All subscribers are encouraged to donate surplus or unwanted items or collections; if interested, please consult the *Microgram* website or contact the *Microgram* Editor for further instructions.**

The next offering of journals and textbooks will be in the October 2005 issue of *Microgram Bulletin*.

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(Third Monthly Posting)

**Sponsoring Organization:** Clandestine Laboratory Investigating Chemists Association

**Inclusive Dates:** September 7 - 10, 2005

**Location:** St. Louis, MO

**Contact Information:** O. Carl Anderson, Kansas Bureau of Investigation, [carl.anderson -at- kbi.state.ks.us](mailto:carl.anderson@kbi.state.ks.us)

**Website:** None

\* \* \* \* \*

**2. Title: Midwestern Association of Forensic Scientists (MAFS) Annual Fall Meeting**

(Third Monthly Posting)

**Sponsoring Organization:** Midwestern Association of Forensic Scientists

**Inclusive Dates:** October 3 - 7, 2005

**Location:** St. Louis, MO

**Contact Information:** Bryan Hampton, [bhampton -at- saintcharlescounty.org](mailto:bhampton@stcharlescounty.org)

**Website:** None

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**3. Title: 17th Triennial Meeting of the International Association of Forensic Sciences (IAFS)**

(Third and Final Bimonthly Posting)

**Sponsoring Organization:** International Association of Forensic Sciences

**Inclusive Dates:** August 21 - 26, 2005

**Location:** Hong Kong Convention and Exhibition Centre (Hong Kong)

**Contact Information:** See Website

**Website:** [www.iafs2005.com](http://www.iafs2005.com)

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# Computer Corner

## Exhibit Differentiation - Digital Evidence Considerations

# #196

by Michael J. Phelan  
DEA Digital Evidence  
Laboratory

The submission of evidence to a forensic laboratory is a routine occurrence. In many cases, however, the initial submission is the only routine aspect of the evidence handling. Objects, more commonly referred to as exhibits or questioned specimens, are routinely subdivided for organizational and reporting purposes. The decision to subdivide an exhibit can be complex. In the physical and biological sciences, there is a preference to analyze homogeneous units. In other forensic disciplines, such as fingerprints or questioned documents, there is often a need to treat each object (fingerprint or document) as a unique item that merits separate tracking, analysis, and reporting.

There are a number of general guidelines that are shared among forensic disciplines that are used to justify the creation of sub-exhibits from a parent exhibit. These include:

1. Is the potential probative value of an exhibit enhanced by its subdivision?
2. Is the resulting forensic analysis substantially clarified by reporting results separately?
3. Does the submitted object consist of non-homogeneous items that should be clustered into homogeneous units in order to more properly characterize their content?

4. Are there collection location issues that merit subdivision?
5. Are there ownership or user association issues that merit subdivision?

Digital evidence shares many of the same concerns regarding subdivision of evidence. In addition, there are further complexities involving exhibit labeling and packaging. Examples of the latter problem areas include:

RAID (Redundant Array Independent Drives) technology utilizes multiple hard drives to store one logical drive (for example, drive c: or d:). A RAID may utilize four or more drives, ensuring that any single hard drive failure will not result in any data loss. This is accomplished by spreading the basic unit of data storage (byte) over several hard drives, and associating a parity bit with each data unit, making it possible to accurately calculate the value of a failed hard drive as long as the remaining hard drives can be validated. This type of evidence should be considered to be one unit, even though it takes four or more hard drives to store the data. Establishing subexhibits of such exhibits is not usually merited; however, the tracking of the hard drives should be performed if they are packaged separately. The preferred method, of course, is one

container holding all of the RAID drives, thereby keeping a 1:1 ratio between the exhibit and its sealed container.

Mirrored hard drives (a different type of RAID technology) consists of two identical drives contained within one computer system. The mirrored drives are another form of data redundancy. As long as the duplicate nature of the data can be verified, the division into subexhibits will not be needed, because the examination results will be identical. However, tracking of both drives should still be performed.

Image spanning, consisting of the copying of a larger hard drive onto smaller capacity hard drives or storage media (DVDs, CDs, or tapes), is commonly used during on-site evidence collections. In such cases, the entire hard drive data is stored as one file that spans multiple storage media. Despite the fact that several pieces of media are being submitted, the image file still contains only one hard drive's content, and all the media should therefore be considered one exhibit. Ideally, the image spanning media should be sealed in one container and tracked as only one unit.

It is also possible to use a single large hard drive to store image files from several smaller hard

drives. In such instances, it is appropriate to use different exhibit numbers if the hard drives are truly unrelated. If the hard drives are taken from the same computer or out of the same room, then the assignment of subexhibit numbers may be more appropriate. This is a decision that should be made on-site by the senior agent in charge. Note that tracking a single hard drive that contains multiple exhibits can be a source of confusion for an evidence tracking system. One method for minimizing confusion is to have a comprehensive imaging work sheet form that documents the situation. Alternatively, detailed examiner notes can also be an effective means as well. It is important that a digital evidence system have the ability to simultaneously track exhibits, subexhibits, and the containers that store the exhibits and/or subexhibits.

Another important consideration involves the labeling and tracking of any archive (duplicate) evidence. Duplicates can be deemed to be best evidence when the original evidence is not available. Accordingly, the labeling and handling of such evidence needs to be identical to original evidence, to ensure its admissibility in a judicial proceeding. Information systems that track digital evidence must be able to: 1) Differentiate the original and duplicate evidence; and 2) Track the sealed containers that store it. The ability to copy digital evidence creates unique accountability issues that digital evidence laboratory evidence

systems must address.

In summary, it is usually very easy to justify the creation of subexhibits when collecting and submitting digital evidence. However, differentiation is not always appropriate. The use of subexhibit assignments should be judiciously used to avoid unnecessary evidence accountability complexity when it serves no investigative or probative benefit.

Similarly, the packaging of related digital evidence objects such as RAIDs, Spanned Images, or Mirrors into separate containers should be avoided, since they are examined as one logical unit. The use of unnecessary sealed packaging is the equivalent of unneeded subexhibit creation. The tracking of multiple containers containing the same exhibit number is also another potential source of confusion for evidence custodians.

Digital evidence management and tracking systems must be able to account for a variety of scenarios that are not normally encountered in most other forms of forensic evidence. Failure to plan for the complexities surrounding original digital evidence, archive evidence, and the attendant storage container scenarios, will result in improper labeling, unneeded subexhibits, and confusion regarding evidence and its containers.

Questions or comments?:  
E-mail: [Michael.J.Phelan-at-usdoj.gov](mailto:Michael.J.Phelan-at-usdoj.gov)

# Microgram

## *Bulletin*

**Published by:**

**The Drug Enforcement Administration  
Office of Forensic Sciences  
Washington, DC 20537**

**The U.S. Attorney General has determined that the publication of this periodical is necessary in the transaction of the public business required by the Department of Justice. Information, instructions, and disclaimers are published in the January issues.**

**VOL. XXXVIII, NO. 8**

**AUGUST 2005**

**- INTELLIGENCE ALERT -**

**“LIQUID METHAMPHETAMINE” SMUGGLED IN A VEHICLE’S WINDSHIELD WASHER AND COOLANT RESERVOIRS IN RIO RICO, ARIZONA**

The DEA Southwest Laboratory (Vista, California) recently provided assistance in sampling and analyzing various vehicle fluids, suspected to contain dissolved methamphetamine hydrochloride. The fluids were taken from the windshield wiper reservoir (8 liters of a light yellow liquid (see Photo 1)), coolant reservoir (3.5 liters of a light yellow liquid), and the radiator (6.3 liters of a pinkish liquid) of a vehicle seized by the Santa Cruz County Sheriff’s Office in Rio Rico, Arizona (Rio Rico is located just north of Nogales, on Interstate 19). The caps of the two reservoirs also displayed some white crystalline material (see Photo 2, next page), that field-tested positive for methamphetamine



**Photo 1**

using the Marquis and the nitroprusside tests. Analysis by GC/MS, IR-ATR, and HPLC confirmed 553 mg/mL, 552 mg/mL, and 3.8 mg/mL d-methamphetamine hydrochloride in the windshield wiper reservoir, coolant reservoir, and radiator, respectively. The low concentration in the radiator is suspected to be from a small amount of the fluid in the coolant reservoir being siphoned back into the radiator during the heating and cooling cycles. This is the first submission of “liquid methamphetamine” to the Southwest Laboratory, and also the laboratory’s first encounter with this smuggling technique.



**Photo 3**

\* \* \* \* \*

### **- INTELLIGENCE ALERT -**

### **COCAINE SMUGGLED INSIDE WOODEN DOWELS IN NEW YORK, NEW YORK**

The DEA Northeast Laboratory (New York, New York) recently received 14 wooden dowels (approximately 1.5 inches in diameter by 41 inches long) containing a white powder, suspected cocaine (see Photos 3 - 5). The exhibits were included in a shipment of bamboo window blinds, and were seized by U.S. Customs and Border Protection personnel from a cargo shipment (details of seizure not provided). Analysis of the powder (total net mass 8.85 kilograms) by FTIR, GC/FID, and GC/MS confirmed 77 percent cocaine hydrochloride. The Northeast Laboratory routinely receives a variety of exhibits employing different smuggling techniques, including exhibits where controlled substances were hidden within a variety of different objects made of wood; however, this was the laboratory’s first encounter with cocaine in false dowels.



**Photo 3**

\* \* \* \* \*



**Photo 4**



**Photo 5**



**- INTELLIGENCE BRIEF -**

**SUSPECTED COCAINE NEAR BESSEMER, ALABAMA  
IDENTIFIED AS PSEUDOEPHEDRINE**

The DEA South Central Laboratory (Dallas, Texas) recently received 26 ziplock plastic bags wrapped in green cellophane and containing an off-white powder (total net mass 12.6 kilograms), that field-tested positive for cocaine (see Photo 6). The exhibits were seized by a Bessemer, Alabama police officer pursuant to a traffic stop on I-20 (Bessemer is located southwest of Birmingham). However, analysis of the powder by FTIR, GC/MS, and HPLC indicated not cocaine but rather 91 percent pseudoephedrine hydrochloride. This was the first seizure of bulk pseudoephedrine packaged as a controlled substance to the South Central Laboratory. It is not known why the samples field-tested positive for cocaine.



**Photo 6**

\* \* \* \* \*

**- INTELLIGENCE ALERT -**

**COCAINE IN TWO-LAYER METAL POTS (FROM TRINIDAD)  
AT MIAMI INTERNATIONAL AIRPORT**

The DEA Southeast Laboratory (Miami, Florida) recently received three metal (presumed aluminum) pots containing a white powder, suspected cocaine (see Photo 7). The pots (about 8 inches in diameter by 3 inches tall) were seized by Immigration and Customs Enforcement personnel at Miami International Airport from a individual arriving from Port-of-Spain, Trinidad. The powder (total net mass 5,791 grams) was concealed between layers in the pots (see Photo 8, next page). Analysis by GC/MS and FTIR confirmed 80 percent cocaine hydrochloride. This was the first submission of this type to the Southeast Laboratory.



**Photo 7 (Note 6 inch scale on the paper)**





**Photo 8**

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**- INTELLIGENCE BRIEF -**

**LARGEST EVER SEIZURE OF PHENCYCLIDINE IN ORANGE COUNTY  
(CALIFORNIA) HISTORY**

[From the NDIC *Narcotics Digest Weekly* 2005;4(27):1  
Unclassified, Reprinted with Permission.]

On June 4, 2005, Orange County Sheriff's Department deputies seized a PCP (phencyclidine) laboratory in Ladera Ranch, an upscale community south of Los Angeles. Sheriff's deputies discovered the laboratory, which was located in a garage of an apartment complex, after nearby citizens reported a chemical smell emanating from the garage. Officers located the apartment unit and the individual using the garage; however, when they attempted to confront the suspect in his apartment, he fled the scene. A foot chase ensued, and the suspect escaped. The suspect remains a fugitive and is wanted on charges of suspicion of manufacturing PCP and possession of PCP for sale. Law enforcement officers seized 8.5 gallons of PCP, chemicals, and a stolen vehicle at the laboratory site. According to authorities, this was the largest seizure of PCP in Orange County history and the only PCP laboratory seized in the county in recent years.

NDIC Comment: Much of the PCP available throughout the United States is produced by criminal groups and street gangs in Southern California, primarily in the Los Angeles area. These established PCP producers attempt to control production of the drug in their area by threatening violence against others who try to become involved. The location of the PCP laboratory in Orange County, which is adjacent to Los Angeles County, could be an indicator that Los Angeles County PCP producers are expanding their area of operations or that other individuals are becoming involved in PCP production.

PCP production is increasing in southern California. According to El Paso Intelligence Center (EPIC) National Clandestine Laboratory Seizure System (NCLSS) data, eight of the nine PCP laboratories seized nationwide in 2003 were located in California - three in Los Angeles County. (The remaining five were seized in Santa Clara County. Santa Clara County is in the San Francisco Bay Area.) In 2004 six PCP laboratories were seized in the United States - all in Los Angeles County. According to law enforcement reporting, PCP production in Southern California as well as distribution throughout the United States has increased in the past few years, largely because PCP producers who had been incarcerated in the late 1980s have now been released from prison.

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**- INTELLIGENCE BRIEF -**

**OKLAHOMA PSEUDOEPHEDRINE CONTROL STATUTE IMPACTS  
METHAMPHETAMINE LABORATORY SEIZURES AND CLEANUP COSTS**

[From the NDIC *Narcotics Digest Weekly* 2005;4(29):1  
Unclassified, Reprinted with Permission.]

A little over a year ago, Oklahoma's governor signed House Bill (HB) 2176, the landmark antimethamphetamine legislation that restricted the sale of tablets of pseudoephedrine, a precursor used in methamphetamine production. The legislation reclassified pseudoephedrine as a Schedule V narcotic and required that cold medications containing the chemical be placed behind pharmacy counters and that buyers show identification and sign for the purchase. Since the enactment of the law in April 2004, the number of methamphetamine laboratories seized statewide has decreased dramatically - between 70 percent and 80 percent - according to the Oklahoma State Bureau of Narcotics and Dangerous Drugs Control. Prior to enactment of HB 2176, the average number of laboratories seized monthly in Oklahoma by the 25 multijurisdictional drug task forces was 92. In April, the month in which the law went into effect, the number of laboratories seized statewide decreased to 48, and by December the number of laboratories seized dropped more than 50 percent to 21. Overall, the total number of methamphetamine laboratories seized in Oklahoma decreased from 1,233 in 2003 to 812 in 2004; of the 812, almost 43 percent had been seized in the 3 months prior to passage of HB 2176. The decrease in the number of laboratory seizures will have a direct impact on costs associated with methamphetamine production in Oklahoma - most notably cleanup costs. According to the Oklahoma State Bureau of Investigation, it costs the state an average of \$3,500 to clean up a single methamphetamine laboratory. Based on the decrease in the number of laboratories seized in Oklahoma from 2003 through 2004, the state saved an estimated \$1,473,500 in expenses linked to the cleanup of methamphetamine laboratory sites.

NDIC Comment: The success of the pseudoephedrine control legislation in Oklahoma has prompted at least 44 other states to either adopt or consider adopting laws similar to HB 2176. Six of those states now allow only pharmacies to sell drugs containing pseudoephedrine, while seven other states require that retailers lock up pseudoephedrine products or sell them from staffed counters. On the federal level, two U.S. Senators have introduced the Combat Meth Act

of 2005 (Senate Bill 103), which is similar to the legislation adopted in Oklahoma. The original version of the bill required that cold medications containing pseudoephedrine be moved behind pharmacy counters and sold by a licensed pharmacist. As of June 28, 2005, the bill had been revised to allow an exception for stores without a pharmacist on duty, such as convenience stores and some grocery chains. The revised bill would provide states the option of working with the Drug Enforcement Administration (DEA) to license certain employees who are not pharmacists to sell the medications. The bill also would limit the amount that one person could purchase in a 30-day period to 7.5 grams - the equivalent of 250 30-milligram tablets - and require purchasers to show identification and sign for the purchase. A vote on this federal antimethamphetamine bill may occur sometime in July 2005.

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**- INTELLIGENCE BRIEF -**

**MAJOR CANNABIS GROW SITE ERADICATED IN THE SHASTA-TRINITY  
NATIONAL FOREST (NORTHERN CALIFORNIA)**

[From the NDIC *Narcotics Digest Weekly* 2005;4(30):2  
Unclassified, Reprinted with Permission.]

On July 7, 2005, law enforcement officials eradicated 44,109 cannabis plants from a grow site in Shasta-Trinity National Forest in northern California; officials suspect that the site had been operated by Mexican nationals. The grow site, which was detected during a routine aerial reconnaissance flight the previous week, covered nearly 5 acres of land and was situated in a remote area in the eastern part of the forest, north of Shasta Lake and several miles east of Interstate 5. The site seized on July 7 - the largest grow site ever seized in Shasta County - was the first of seven sites seized from July 7 through July 15; the total number of plants seized during that period was 112,214. Near the site seized on July 7 were three campsites where individuals who maintained and guarded the grow site had been living. Several suspects fled the scene when law enforcement officials arrived; no arrests were made at the scene. Officials seized a shotgun and ammunition at the campsites. Participants in the eradication effort included officials with the Shasta County Sheriff's Office Marijuana Eradication Team, Shasta Interagency Narcotics Task Force, U.S. Department of Agriculture Forest Service, California Bureau of Narcotic Enforcement, and Campaign Against Marijuana Planting (CAMP).

NDIC Comment: Mexican drug trafficking organizations (DTOs) increasingly are operating large cannabis grow sites in secluded areas throughout California, and eradication of these sites has increased in the state. Seizures of large cannabis grow sites operated by Asian and Caucasian criminal groups also have increased in California; however, these grow sites tend to be smaller, less sophisticated, and much less frequently encountered by law enforcement authorities than those operated by Mexican DTOs. According to CAMP data, 84 percent of the cannabis plants eradicated in California in 2004 were from grow sites operated by Mexican DTOs - a marked increase from 69 percent of plants eradicated in 2001. CAMP officials report that the size of cannabis grow sites also has increased significantly in recent years - primarily grow sites operated by Mexican DTOs. CAMP data indicate that in the late 1990s, large grow

sites contained 3,000 to 5,000 plants; however, since the early 2000s, large grow sites have contained 5,000 to 10,000 plants. Moreover, very large grow sites - such as the Shasta-Trinity National Forest site with over 44,000 plants - increasingly are being discovered by law enforcement authorities. Federal officials report that Mexican DTOs are expanding their areas of operation and have established cannabis grow sites in other states such as Idaho, Oregon, and Washington. They likely will continue to expand their operations into isolated areas in these and other states.

\* \* \* \* \*

### **Request for Information - Carisoprodol (Soma®)**

Carisoprodol (Soma®) is the recommended international nonproprietary name of a drug prescribed for the relief of pain, muscle spasm and limited mobility associated with painful musculoskeletal conditions. It is used as an adjunct to rest, physical therapy and other measures. It is currently not controlled under the U.S. Controlled Substance Act (CSA), and is available for therapeutic use by prescription. Carisoprodol is both structurally and pharmacologically related to Schedule IV substances, namely meprobamate and mebutamate. Carisoprodol shares some similarities with barbiturates or alcohol in its pharmacological effects.

Reports from medical professionals, state authorities and law enforcement personnel indicate the significant diversion, trafficking, and abuse of carisoprodol. According to the National Forensic Laboratory Information System (NFLIS), federal, state, and local forensic laboratories analyzed 1,992 carisoprodol drug samples in 2004. According to the Drug Abuse Warning Network (DAWN), there were 10,094 emergency department mentions for carisoprodol in 2002. Carisoprodol abuse has resulted in injury (seizures, coma) and death. Carisoprodol has often been abused in combination with products containing narcotic analgesics and/or benzodiazepines. Because of these concerns, some states have controlled carisoprodol.

The Drug Enforcement Administration (DEA) has reviewed the relevant data and requested a scientific and medical evaluation and scheduling recommendation for carisoprodol from the Department of Health and Human Services. The Drug and Chemical Evaluation Section (ODE) of the DEA's Office of Diversion Control continues to gather information on the abuse, diversion, and trafficking of carisoprodol. Reports of actual abuse are extremely important factors in establishing the abuse potential of a substance that is being considered for control under the Controlled Substances Act. ODE would appreciate receiving any information related to law enforcement encounters and/or the identification, diversion, and abuse of carisoprodol. Please contact Dr. Srihari R. Tella, Pharmacologist with ODE, at (202) 307-7183 with any pertinent information pertaining to carisoprodol. Information may also be provided to Dr. Tella by fax ((202) 353-1263), by email to: Srihari.R.Tella -at- usdoj.gov, or by mail addressed to the Drug and Chemical Evaluation Section, Office of Diversion Control, Drug Enforcement Administration, Washington, DC 20537.

\* \* \* \* \*

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[Selected references are a compilation of recent publications of presumed interest to forensic chemists. Unless otherwise stated, all listed citations are published in English. Listed mailing address information (which is sometimes cryptic or incomplete) exactly duplicates that provided by the abstracting services. Patents are reported only by their *Chemical Abstracts* citation number.]

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6. Honorio KM, daSilva ABF. **A study on the influence of molecular properties in the psychoactivity of cannabinoid compounds.** *Journal of Molecular Modeling* 2005;11(3):200. [Editor's Notes: The AM1 method was used on 28 different cannabinoids. Contact: Univ Sao Paulo, Dept Quim & Fis Mol, Inst Quim Sao Carlos, CP 780, BR-13560970 Sao Carlos, SP, Brazil.]
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9. Hyun MH, Tan G, Cho YJ. **Liquid chromatographic enantioseparation of aryl alpha-amino ketones; cathinone.** Biomedical Chromatography 2005;19(3):208. [Editor's Notes: Used a crown ether-based chiral stationary phase. The resolution of cathinone was judged to be applicable for the analysis of khat. Contact: Pusan Natl Univ, Dept Chem, Pusan 609735, South Korea.]
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13. Siegner AW, Jr. **The Food and Drug Administration's actions on Ephedra and androstenedione: Understanding their potential impacts on the protections of the Dietary Supplement Health and Education Act.** Food and Drug Law Journal 2004;59(4):617. [Editor's Notes: Abstract and Contact information not provided.]
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Contact: Analytical Chemistry Laboratory, Division of Identification and Forensic Science, National Police Headquarters, Jerusalem, Israel.]

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### **THE DEA FY - 2005 AND FY - 2006 STATE AND LOCAL FORENSIC CHEMISTS SEMINAR SCHEDULE**

The remaining FY - 2005 schedule for the DEA's State and Local Forensic Chemists Seminar is as follows:

September 19 - 23, 2005

The FY - 2006 schedule is as follows:

November 14 - 18, 2005

February 6 - 10, 2006

May 8 - 12, 2006

July 10 - 14, 2006

September 11 - 15, 2006

Note that the school is open only to forensic chemists working for law enforcement agencies, and is intended for chemists who have completed their agency's internal training program and have also been working on the bench for at least one year. There is no tuition charge for this course. The course is held at the AmeriSuites Hotel in Sterling, Virginia (near the Washington/Dulles International Airport). A copy of the application form is reproduced on the last page of the August 2004 issue of *Microgram Bulletin*. Completed applications should be mailed to the Special Testing and Research Laboratory (Attention: Pam Smith or Jennifer Kerlavage) at: 22624 Dulles Summit Court, Dulles, VA 20166. For additional information, call 703/668-3337.

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## SCIENTIFIC MEETINGS

**1. Title: 15th Annual CLIC Technical Training Seminar**

(Fourth and Final Monthly Posting)

**Sponsoring Organization:** Clandestine Laboratory Investigating Chemists Association

**Inclusive Dates:** September 7 - 10, 2005

**Location:** St. Louis, MO

**Contact Information:** O. Carl Anderson, Kansas Bureau of Investigation, [carl.anderson@kbi.state.ks.us](mailto:carl.anderson@kbi.state.ks.us)

**Website:** None

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**2. Title: Midwestern Association of Forensic Scientists (MAFS) Annual Fall Meeting**

(Fourth Monthly Posting)

**Sponsoring Organization:** Midwestern Association of Forensic Scientists

**Inclusive Dates:** October 3 - 7, 2005

**Location:** St. Louis, MO

**Contact Information:** Bryan Hampton, [bhampton@saintcharlescounty.org](mailto:bhampton@saintcharlescounty.org)

**Website:** None

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## Computer Corner

Digital Laboratory Efficiency Strategies

## #197

by Michael J. Phelan  
DEA Digital Evidence  
Laboratory

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Digital Evidence Laboratory managers have two general responsibilities - Quality and Quantity. Digital Evidence Laboratory managers must first and always focus on quality, ensuring that the examination sufficiency is commensurate with the investigator's and prosecutor's needs. The cost of an incomplete, incorrect, or poorly executed examination can easily become enormous in terms of damaged organizational reputation, and for additional corrective action response efforts such as re-examination time, re-training time, and quality assurance/managerial oversight time.

In addition to ensuring Quality, managers need to routinely review their business practices to ensure that their digital evidence laboratories are operating as efficiently as possible. Digital evidence examinations utilize high-cost personnel (commercial labor rates range from \$60 - \$400 per hour) and are time intensive (an average computer examination takes 40 work-hours). Failure to optimize examiner activities can result in wasted examination efforts, which in turn results in inefficient use of resources and reduced laboratory productivity (meaning fewer examinations are completed).

There are at least six major areas that need continuous assessment and monitoring. These are: Functional specialization, examiner training, examiner recruitment, technology, cost control, and quality assurance. Each of these areas can impact one or more of the key operational aspects of a digital evidence laboratory, such as evidence handling, imaging/archiving, examination, and reporting. The Strategy Matrix below was developed to identify the relative importance that various management techniques can have on key laboratory operations.

### Digital Evidence Laboratory Management Strategy Matrix

	<b>Evidence Handling</b>	<b>Imaging/Archiving</b>	<b>Examination</b>	<b>Reporting</b>
<b>Specialization</b>	Important	Very Important	Very Important	Useful
<b>Training</b>	Important	Very Important	Extremely Important	Useful
<b>Recruitment</b>	Important	Very Important	Extremely Important	N/A
<b>Technology</b>	Extremely Important	Extremely Important	Extremely Important	Extremely Important
<b>Cost Control</b>	Important	Important	Important	N/A
<b>Quality Assurance</b>	Extremely Important	Extremely Important	Extremely Important	Extremely Important

Specialization is a traditional management efficiency technique that is usually more suited to centralized laboratory operations because of the potential benefits resulting from economy of scale. An example of an evidence handling efficiency improvement would be to add an evidence technician position to receive and handle digital evidence submissions. This specialization sharply reduces or even eliminates the need for a higher paid examiner or supervisor to intake, label, package, and control digital evidence exhibits. Another specialization strategy would be the use of full time technical staff (imagers) to copy and archive digital evidence. Like the above suggestion to add an evidence technician, this specialization of labor also avoids using more skilled and more highly trained examiner staff to perform an important, but fairly routine task. Similarly, examinations of non-routine submissions such as web or database servers, Macintosh computers, Reduced Instruction Set Computers, can be assigned to those examiners who are most qualified to process these uncommonly encountered technologies. Specialization can even be applied to examination reporting; for example, the use of clerical staff to oversee the distribution of reports and filing can result in overall laboratory productivity enhancements, again by freeing up more specialized personnel to focus on their primary responsibilities.

In the areas of digital evidence laboratory training and recruitment, management should periodically review the staff's current technical and operational capabilities, and identify future needs, before they arrive and become impediments to productivity. Just five years ago, the basic examiner skill set "only" involved mastery of one or more standard imaging tools and a suite of software examination utilities, including keyword searching, unerase file recovery, and file fragment data reconstruction. In contrast, today's basic skill set includes multiple imaging tools, mastery of at least one full-scope examination program (such as Encase, Ilook, FTK, Vogon, etc.), and a working knowledge of both Internet (HTML) and database (such as SQL) technologies. Management needs to ensure that today's staff is trained for today's requirements - but also while keeping a wary eye on tomorrow's challenges. Obviously, management must anticipate future requirements when it recruits new employees. Therefore, each law enforcement agency needs to have a clear understanding of future investigative initiatives, and the likely impact that they will have on the digital evidence examination workload. Furthermore, because different law enforcement organizations investigate different types of crimes (fraud, Internet intrusion, child exploitation, etc.), their respective digital examiners should have specialized knowledge and skills (such as databases, Internet technologies, HTML coding, operating system logs, etc.), as needed to address those missions.

Technology is another area that offers potential enhancements in productivity. Some recent technological advances that are already benefiting digital evidence laboratories include: 1) Storage Area Networks (SANs) to store and distribute digital evidence copies for examination; 2) DVD/CD robotics or automated tape loader systems to automate the evidence archiving processes; 3) Faster computer systems and more powerful examination software to maximize examination quality and examiner productivity; and 4) Laboratory automation or information system technologies that can better document, compose, store, and distribute examination work products.

Cost Control is an important matter for any manager that has budget constraints (and what manager does not?). The most important cost element in any digital evidence laboratory is examiner time (time is money). Therefore, digital evidence laboratories should establish firm limits of examination levels of effort. Supervisors need to direct work in order to ensure that frivolous and/or unnecessary examination tasks are not performed. For example, a fraud investigation may require only a business's database records, a child exploitation investigation may need only a minimum number of incriminating pictures, a hacker investigation may require computer log data covering only a very specific time period, and a conspiracy investigation may require only certain e-mail communications. "Global" examinations are no longer feasible or necessary. Supervisors should ensure that digital evidence collections are sufficiently broad to address possible unknown investigative directions; however, the actual examination effort needs to be properly scoped out, and should represent a consensus among the case agent, examiner, and examiner's supervisor.

Quality Assurance activities should be viewed as an opportunity, not a cost. Failure to ensure quality will only result in additional time, effort, and expense for both laboratory management and examiner staff, to correct and/or remediate problems that could have (and should have) been avoided. Quality assurance systems need to be documented, sufficiently broad to include all major elements of laboratory operations, and have objectives that can be routinely monitored (and corrected as needed). Quality assurance is a full time activity that requires independence and high level management access.

No two digital evidence programs are the same, even those with nominally identical missions. Digital evidence laboratory management must adapt their strategies to their unique organizational situation and budgetary realities. Systematic reviews of opportunities to increase productivity should be made on a regular basis. There is an old aphorism that: *If things are staying the same, it probably means that you are falling behind.* This is certainly true in the world of technology, and it is also applicable in the world of management.

Questions or comments? E-mail: [Michael.J.Phelan -at- usdoj.gov](mailto:Michael.J.Phelan-usdoj.gov)

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# Microgram

## *Bulletin*

**Published by:**

**The Drug Enforcement Administration  
Office of Forensic Sciences  
Washington, DC 20537**

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**VOL. XXXVIII, NO. 9**

**SEPTEMBER 2005**

**- INTELLIGENCE ALERT -**

**CIGARETTES LACED WITH COCAINE BASE IN BLAINE, WASHINGTON**

The DEA Western Regional Laboratory (San Francisco, California) recently received an opened cigarette pack containing 18 cigarettes with twisted ends (total net mass 14.0 grams), suspected to contain cocaine (see Photo 1). The cigarettes were seized pursuant to a vehicle search by Immigration and Customs Enforcement agents in Blaine, Washington (at the border). The cigarettes and package appeared to be commercially manufactured, and had well-known commercial logos and labelling (but oddly, for two different brands of cigarettes). Upon closer inspection, the tobacco in the cigarettes was covered by a fine, off-white powder (see Photo 2, next page; shown oversize to display detail). Analysis of a methylene chloride extract by GC/MS and IR-ATR confirmed approximately 20 percent cocaine base (equivalent to an average of 155 milligrams of cocaine base per cigarette). This was first submission of cocaine-laced cigarettes to the Western Laboratory.



**Photo 1**



**Photo 2**

\* \* \* \* \*

**- INTELLIGENCE ALERT -**

**LARGE OPIUM POPPY PLANTATION IN HERINGTON, KANSAS**

The DEA North Central Laboratory (Chicago, Illinois) recently received two exhibits of suspected opium poppy plants. The first exhibit consisted of 10 intact poppy plants (total net mass 1,152 grams), complete with roots and multiple pods (see Photo 3). The second exhibit consisted of three boxes of pods (total net mass 4,741 grams). The material was acquired by agents from the DEA Kansas City District Office and the Kansas State Police from a large poppy plantation outside a residence in Herington, Kansas (Herington is located in east/central Kansas). In total, approximately 14,000 plants were seized (see Photo 4, next page). The collection was done during a rain storm and the plants were still wet when submitted to the laboratory, and had to be air dried for several days before analysis. The selected pods for both exhibits were crushed, soaked in saturated sodium bicarbonate, and extracted with chloroform. Analysis of the extracts by



**Photo 3**



GC/MS identified morphine, codeine, and papaverine, confirming opium (alkaloids not quantitated, but apparently in relatively low concentrations). Based on interviews with the homeowners and no evidence of cultivation efforts or opium collection (all pods were unincised), the agents determined there was no criminal intent (apparently, the homeowners merely appreciated the appearance of the flowers, and were unaware of the legal status of opium poppies). The non-submitted plants were destroyed. This was the largest poppy plant/pod exhibit ever submitted to the North Central Laboratory.



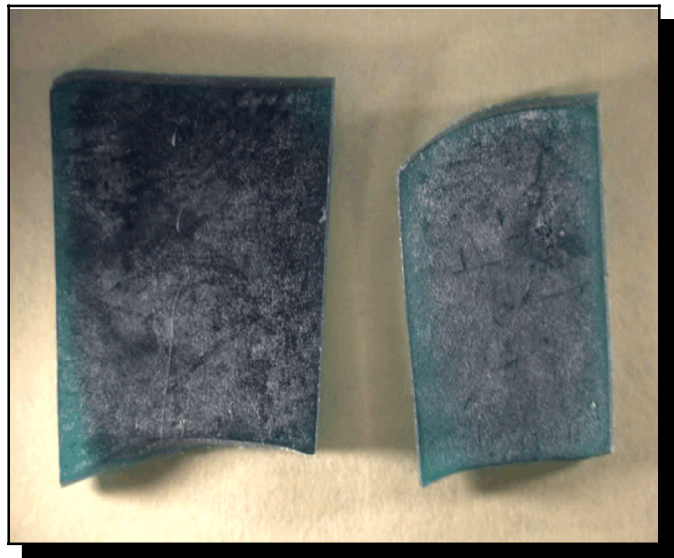
**Photo 4**

\* \* \* \* \*

**- INTELLIGENCE ALERT -**

**WATER SOLUBLE MATRIX (CONTAINING COCAINE) SEIZED IN OR  
NEARBY VILLAVICENCIO, COLOMBIA, SOUTH AMERICA**

The DEA Special Testing and Research Laboratory (Dulles, Virginia) recently received an exhibit of a blue-green, rubber-like material (total net mass 42 grams) that was alleged to contain cocaine (see Photo 5). The exhibit was acquired by a Colombian Anti-Kidnapping Unit in or nearby Villavicencio, Colombia, South America (circumstances of seizure not reported). The sample was coated with a white powdery residue, measured approximately 100 x 65 millimeters, and ranged in thickness from 1 to 3 millimeters. Field-testing of the material and the powdery residue did not indicate the presence of cocaine. Experimentation determined that the material would



**Photo 5 (2 of 56 cut up pieces)**

dissolve in water with vigorous vortexing, suggesting it was gelatin (not rubber or plastic) based. Analysis of a chloroform extract of the basified liquid by GC and GC/MS confirmed 13.6 percent cocaine (calculated as the hydrochloride) and aminopyrine (not quantitated). Further analysis of the white powdery residue by GC, FTIR-ATR, and microscopy confirmed that it did not contain cocaine or aminopyrine. While samples composed of various plastic matrices containing cocaine have been previously

submitted to the Special Testing and Research Laboratory, this is the first submission of a water-soluble matrix containing cocaine. It is unclear how this material would be used as a smuggling aid; however, past reports have indicated use of similar materials in a wide variety of consumer products (suitcase linings, hat brims, clothing, etc.).

\* \* \* \* \*

**- INTELLIGENCE ALERT -**

**THC-LACED PSILOCYBIN MUSHROOMS IN PERRIS, CALIFORNIA**

The California Department of Justice Riverside Crime Laboratory (Riverside, California) recently received a submission of apparent psilocybin mushrooms (see Photo 6). The mushrooms (total net mass approximately 125 grams) were seized by the Riverside County Sheriff's Office (Perris Station) pursuant to a routine traffic stop in Perris (Perris is located south-southeast of Riverside). Preliminary screening of a methanolic extract by GC, however, indicated both psilocin/psilocybin and  $\Delta^9$ -tetrahydrocannabinol (THC). Additional testing (Duquenois/Levine and GC/MS) confirmed both psilocin/psilocybin and THC. The controlled substances were not quantitated; however, the amount of THC was significant and consistent with deliberate adulteration. Since there was no evidence of cannabis in the sample, it appears that the mushrooms were soaked in or sprayed with a solution of THC.



**Photo 6**

According to the analyst, this was the first case of THC-laced psilocybin mushrooms at the Riverside Crime Laboratory in his 15 years experience.

\* \* \* \* \*

**- INTELLIGENCE BRIEF -**

**METHAMPHETAMINE LABORATORIES SEIZED IN BEL AIR, MARYLAND  
AND COLLINSVILLE, PENNSYLVANIA**

[From the NDIC *Narcotics Digest Weekly* 2005;4(35):1  
Unclassified, Reprinted with Permission.]

On July 14, 2005, federal and state law enforcement officials seized two methamphetamine laboratories near Bel Air (MD) and one in Collinsville (PA). Surveillance determined that seven members of a criminal group operated the three red phosphorus method laboratories, and authorities believe that the laboratories had been operational since 2004. One laboratory was

located in a trailer on a farm near Bel Air and is the largest seized in the state in the last 5 years; up to a pound of methamphetamine could have been produced per production cycle at this laboratory. Two of the arrestees and their 5-year-old daughter lived in the trailer. The second laboratory seized in Bel Air was located in the basement of a residence. Both Bel Air laboratories were in the final stages of methamphetamine production at the time of the seizures. The Collinsville methamphetamine laboratory was located in a residence reportedly owned by a relative of a member of the criminal group. The two smaller laboratories had production capacities of one-quarter to one-half ounce per production cycle. The methamphetamine producers also distributed the drug - usually in multigram-quantities - to local methamphetamine users. Four of the arrested individuals were indicted in federal court; each faces a possible maximum sentence of 40 years in prison. The other three individuals face state charges in Maryland. The Drug Enforcement Administration (DEA), Harford County (MD) Sheriff's Office, Pennsylvania State Police (PSP), and U.S. Attorney's Office for the District of Maryland conducted the investigation.

NDIC Comment: These laboratory seizures are significant because methamphetamine production, distribution, and abuse had not posed a major threat to Maryland prior to 2005. In addition to the seizures reported above, law enforcement officers in Charles and St. Mary's Counties seized a methamphetamine laboratory in La Plata on July 19, 2005, bringing the total number of methamphetamine laboratories seized in Maryland in 2005 to six. According to the Washington/Baltimore High Intensity Drug Trafficking Area (HIDTA), the number of methamphetamine laboratories seized in Maryland increased from two in 2001 to eight in 2004. In comparison, methamphetamine production, distribution, and abuse have been increasing in Pennsylvania since 2000, particularly in the northern tier counties. The number of methamphetamine laboratories seized in Pennsylvania increased from 19 in 2001 to 128 in 2004, and as of early August 2005, PSP reported 78 laboratory seizures throughout the state.

\* \* \* \* \*

## SELECTED REFERENCES

[Selected references are a compilation of recent publications of presumed interest to forensic chemists. Unless otherwise stated, all listed citations are published in English. Listed mailing address information (which is sometimes cryptic or incomplete) exactly duplicates that provided by the abstracting services. Patents are reported only by their *Chemical Abstracts* citation number.]

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2. Blachut D, Wojtasiewicz K, Czarnocki Z. **Some pyridine derivatives as "route-specific markers" in 4-methoxyamphetamine (PMA) prepared by the Leuckart method.** *Forensic Science International* 2005;152(2-3):157. [Editor's Notes: The authors claim that several newly identified "high-boiling pyridines" may be especially useful synthetic markers, since they are unlikely to be removed from the final products even via careful purification techniques. Contact: Internal Security Agency, Department of Criminalistics, 1 Sierpnia 30A, Warsaw 02-134, Pol.]

3. Camilleri AM. **Underground pill testing, down under.** Forensic Science International 2005;151(1):53. [Editor's Notes: Laboratory results of tablets voluntarily submitted by users at a "Rave" were compared with the results of on-site color testing. Contact: Forensic Science South Australia, 21 Divett Place, Adelaide, Australia.]
4. Campbell JG, Grossman SI. **Apparatus for detecting drugs in a beverage.** (Patent) Chemical Abstracts 2005;143:54892g.
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6. Lachenmeier DW, Walch SG. **Analysis and toxicological evaluation of cannabinoids in hemp food products.** Electronic Journal of Environmental, Agricultural and Food Chemistry 2005;4(1):(No Page Numbers). [Editor's Notes: An overview of the title topic. Includes discussion of the "hemp food products" situation in the European Union. Contact: Chemisches und Veterinaeruntersuchungsamt Karlsruhe, Karlsruhe D-76187, Germany.]
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8. Mitrevski B, Zdravkovski Z. **Rapid and simple method for direct determination of several amphetamines in seized tablets by GC-FID.** Forensic Science International 2005;152(2-3):199. [Editor's Notes: Included the analyses of MDA, MDMA, MDEA, and MBDB as well as amphetamine and methamphetamine. Contact: Forensic Science Unit, Ministry of Internal Affairs, Dimce Mircev bb, Skopje 1000, Macedonia.]
9. Nguyen DT, Bui TH. **Analysis of amphetamines in narcotic samples.** Tap Chi Duoc Hoc 2005;45(2):20. [Editor's Notes: Uses a combination of color reactions, TLC, and GC to perform both qualitative and quantitative analyses. The "narcotics" were primarily methamphetamine and MDMA, most in tablet form. This article is written in Vietnamese. Contact: Phan Vien Khoa hoc Hình su Bo Cong An, Vietnam.]
10. Sharma SP, Purkait BC, Lahiri SC. **Qualitative and quantitative analysis of seized street drug samples and identification of source.** Forensic Science International 2005;152(2-3):235. [Editor's Notes: Presents the analysis of heroin seized in eastern India, using GC/MS and HPTLC. Some minor (mostly unsuccessful) efforts were made to determine the respective sources of the drugs based on the analytical results. Contact: Central Forensic Science Laboratory, 30 Gorachand Road, Kolkata, WB 700014, India.]
11. Swist M, Wilamowski J, Parczewski A. **Determination of synthesis method of Ecstasy based on its basic impurities.** Forensic Science International 2005;152(2-3):175. [Editor's Notes: MDMA was synthesized via five different methods, and the impurity profiles of the respective routes determined by GC/MS. Contact: Department of Analytical Chemistry, Faculty of Chemistry, Jagiellonian University, Ingardena 3, Krakow 30-060, Pol.]

12. Wu G, Cai X, Xiang B. **Identification of synthesis routes of "Ecstasy" by GC-MS coupled soft independent modeling of class analogies.** Sepu 2005;23(2):214. [Editor's Notes: Uses GC-MS coupled SIMCA to link impurity profiles to synthetic routes for MDMA. This article is written in Chinese. Contact: Analytical Test Center, China Pharmaceutical University, Nanjing, Jiangsu, Peop. Rep. China 210009.]
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#### **Additional References of Possible Interest:**

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6. Zuccato E, Chiabrando C, Castiglioni S, Calamari D, Bagnati R, Schiarea S, Fanelli R. **Cocaine in surface waters: A new evidence-based tool to monitor community drug abuse.** Environmental Health 2005;4(14):(No Page Numbers). Editor's Notes: Analysis for trace cocaine in urban waste streams allow an indirect estimation of total abuse in the respective community (results from Italy). Contact: Department of Environmental Health Sciences, Mario Negri Institute for Pharmacological Research, Via Eritrea 62, 20157 Milan, Italy.]

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## THE DEA FY - 2006 STATE AND LOCAL FORENSIC CHEMISTS SEMINAR SCHEDULE

The FY - 2006 schedule for the DEA's State and Local Forensic Chemists Seminar is as follows:

November 14 - 18, 2005  
February 6 - 10, 2006  
May 8 - 12, 2006  
July 10 - 14, 2006  
September 11 - 15, 2006

Note that the school is open only to forensic chemists working for law enforcement agencies, and is intended for chemists who have completed their agency's internal training program and have also been working on the bench for at least one year. There is no tuition charge for this course. The course is held at the AmeriSuites Hotel in Sterling, Virginia (near the Washington/Dulles International Airport). A copy of the application form is reproduced on the last page of the August 2004 issue of *Microgram Bulletin*. Completed applications should be mailed to the Special Testing and Research Laboratory (Attention: Pam Smith or Jennifer Kerlavage) at: 22624 Dulles Summit Court, Dulles, VA 20166. For additional information, call 703/668-3337.

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## SCIENTIFIC MEETINGS

**1. Title: Midwestern Association of Forensic Scientists (MAFS) Annual Fall Meeting** (Fifth and Final Posting)  
**Sponsoring Organization:** Midwestern Association of Forensic Scientists  
**Inclusive Dates:** October 3 - 7, 2005  
**Location:** St. Louis, MO  
**Contact Information:** Bryan Hampton, [bhampton-at-saintcharlescounty.org](mailto:bhampton-at-saintcharlescounty.org)  
**Website:** None

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## EMPLOYMENT OPPORTUNITIES

**1. U.S. Drug Enforcement Administration** (First Posting)  
**Position:** Forensic Chemist (Up to 10 Positions Available)  
**Location:** Dallas, Texas  
**Salary Range:** \$32,084 (GS-5) - \$67,033 (GS-11) - Promotional potential to GS-13  
**Application Deadline:** Open Until Filled  
**Detailed Information and Application:** <https://www.avuedigitalservices.com/dea/applicant.html>  
**Vacancy Announcement Number:** DEA-SCLAB-05-0297-MP (Merit Promotion) or DEA-SCLAB-05-0297-DEU (All Others)

\* \* \* \* \*

**2. U.S. Drug Enforcement Administration** (First Posting)  
**Position:** Fingerprint Specialist (1 Position Available)  
**Location:** San Francisco, California  
**Salary Range:** \$57,178 - \$105,939  
**Application Deadline:** Open Until Filled  
**Detailed Information and Application:** <https://www.avuedigitalservices.com/dea/applicant.html>  
**Vacancy Announcement Number:** DEA-WEST-05-0293-MP (Merit Promotion) or DEA-WEST-05-0293-DEU (All Others)



# Computer Corner

## Digital Evidence Courtroom Vocabulary

# #198

by Michael J. Phelan  
DEA Digital Evidence  
Laboratory

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The presentation of digital evidence findings in court can be challenging. The digital evidence examiner must be able to reduce even a highly complex evidence handling and examination process to an easy-to-comprehend, but accurate, description of how the potential case-related information was recovered - and must also be able to explain the potential significance of the findings. One of the more important responsibilities for the examiner is to limit the use of technical jargon in both the formal written report and during actual oral court testimony. Although most jurors probably use a computer or electronic data communication/storage device (e.g., a cell phone, Personal Digital Assistant, or digital camera) on a regular basis, their understanding of basic digital electronics or computers is very limited - and furthermore may be partly or wholly incorrect. An effective expert witness will minimize juror confusion by employing non-technical language and explanations whenever feasible, or by supplementing technical terminology with simple, descriptive analogies.

A list of frequently used computer forensic and general computer technical terms is compiled below. Each technical term is followed by a simple phrase that describes the term (the italic wording within the parentheses) along with a more formal and comprehensive definition.

### **Computer Forensic Terminology:**

**Cookie** (*Commercial ID tag*) Small block of data placed on the hard drive to uniquely identify a user or computer. Cookie data is usually pushed onto a user's computer over the Internet to facilitate identification of a previous customer.

**Encryption** (*Data hiding*) Commercially available or proprietary software that systematically scrambles and unscrambles information. Scrambled data is stored in a standard file format.

**Erased File** (*File marked as "erased" and not directly accessible to a user*) File type that may be overwritten by the computer to store other types of information.

**Hash Set** (*File fingerprints*) Group of known files and their corresponding hash values that are used to eliminate benign files (negative hash) from further examination (such as standard computer operating system files) or identify (positive hashing) files of known interest (such as child pornography images).

**Image File** (*Digital evidence copy*) File that contains an accurate representation of the original evidence.

**Log Data** (*Activity summary*) Automated recording of user, computer networking, or computer operating activity that may contain software installation and setting information, user registration data, or a running account of a computer process.

**MD-5 Hash** (*Copy verification technique*) Computer program that summarizes the constituent components of any type of digital information into a summary value which has a known calculated estimate of certainty. The probability of two files being different but having the same MD-5 hash value is 1 in  $2^{128}$  (i.e., the number 34 followed by 37 zeros).

**Media** (*Data storage device*) Any internal or external computer data storage device such as diskettes, tapes, data cartridges (Zip or Jaz), flash memory cards, thumb drives, etc.

**Meta Data** (*File attribute information*) Data that documents file access privileges such as create, edit, delete, print or contains date/time information regarding file creation, edit, and last access.

**Password Protected** (*Data locking*) Software security logic that contains instructions that prevents a file from being accessed unless a previously defined string of characters is entered first by the user.

**Slack Space** (*Filler keystroke data*) Data inserted at the end of any file that optimizes the transfer of blocks of data within a computer. Can contain user keystroke or printed data that was retained in memory as part of some other recent computer process.

**Steganography** (*Data hiding*) Commercially available or proprietary software that systematically scrambles and unscrambles information. Scrambled data is stored within a document, picture, audio, or standard file format making detection difficult.

**Swap File** or **Page File** (*Digital scratch pad area*) Reserved hard drive data storage area that is managed by a computer operating system and is inaccessible to most computer programs. It may contain user or system created data that was recently processed in the computer.

**Temporary Internet Folder** (*Internet web page copies*) Contents of visited web pages that are stored in this hard drive folder to facilitate rapid reloading of web page information from local hard drive storage and avoid lengthy retransmission over the network.

**Unallocated Cluster** or **Free Space** (*File fragment information*) Digital evidence storage area that contains computer system data or user keystroke data.

**Volatile Memory** (*Data storage area that requires a constant source of electrical current*) Type of memory that is found in many consumer electronic devices that require continuous electrical power (usually battery operated) to operate and continuously store data. Cell phones and two-way pagers are examples. Volatile memory devices are highly susceptible to data loss.

**Wiped** (*Overwritten*) Term denotes the obliteration of original digital data by overwriting the storage location one or more times. Wipe software is used in digital forensics to eliminate the possibility of any data contamination on media from a previous case. The software is also used as a computer security tool to permanently eliminate sensitive information.

**Write Block** (*Data lock*) Hardware device or software program that prevents data being inadvertently placed on a media (in digital evidence, on the original evidence).

### **General Computer Terminology:**

**Compressed** (*Data abbreviation*) Data that is systematically reduced in size and contains the essential content of the original. Data compression is often used to speed up data transmission by making transmission packets smaller, or more efficiently stores a large volume of data (i.e., in a smaller area).

**Computer Virus** (*Malicious computer program*) Computer instructions or programs that change, erase, or relocate stored user data or computer programs for malicious reasons. Other forms of computer "malware" include "spyware" (transmits out user computer activity), keystroke loggers, or screen capture programs.

**CPU** (short for *Central Processing Unit*) Computer component which is either: 1) the case that contains the main processing components including the central logic unit, main memory, power supply, data bus, and interface controllers (video, sound, networking, communications), and cooling systems (fans and heat sinks); or 2) the central component in a computer that is responsible for both arithmetic computation and logic branching, or for comparisons.

**Drive** (short for “*Hard drive*”) Refers to a large capacity - high performance data storage device found in almost all computers. Hard drives may be logically clustered together for data redundancy or performance benefits.

**Folder** (*File cabinet*) Organizational technique to store similar file types or information types to make user access more straightforward.

**Internet** (commonly referred to as the *World Wide Web*) Worldwide, computer based, information transmission and storage network. Consists of web hosting sites, e-mail servers, news groups, and e-commerce portals.

**Logical Data** (*Files, folders, partitions*) Data structures that exist as part of the standard operating system formatting process.

**Physical Data** (*Data stored at a specific location*) Data located at a specific storage address that exists independent of any operating system format, or file format.

**Script** (*Computer program*) Specialized or "on the fly programs" that process raw data to enhance usefulness. Often used to eliminate data errors, or sort, select, append, or truncate larger data files into smaller data files.

Questions or comments? E-mail: [Michael.J.Phelan -at- usdoj.gov](mailto:Michael.J.Phelan-usdoj.gov)

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# Microgram

## *Bulletin*

**Published by:**

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Office of Forensic Sciences  
Washington, DC 20537**

**The U.S. Attorney General has determined that the publication of this periodical is necessary in the transaction of the public business required by the Department of Justice. Information, instructions, and disclaimers are published in the January issues.**

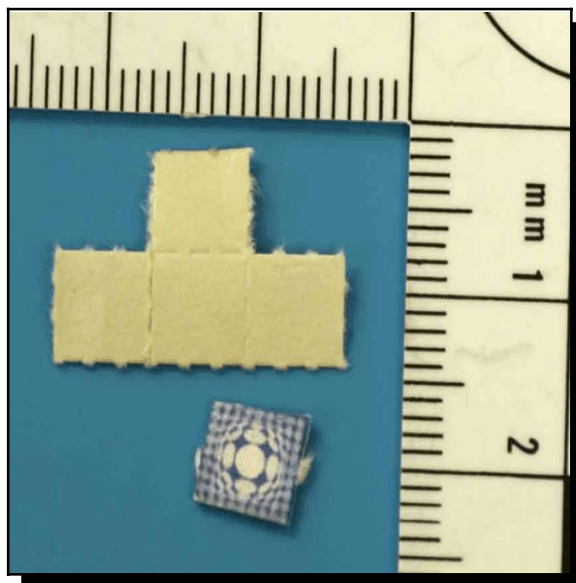
**VOL. XXXVIII, NO. 10**

**OCTOBER 2005**

**- INTELLIGENCE ALERT -**

**LSD BLOTTER ACID MIMIC CONTAINING 4-BROMO-2,5-DIMETHOXY-AMPHETAMINE (DOB) SEIZED NEAR BURNS, OREGON**

The Oregon State Police Forensic Services Division Laboratory (Ontario, Oregon) recently received a polydrug submission that included nine perforated paper squares, some plain, some imprinted with a “psychedelic” pattern, apparent LSD “Blotter Acid” (see Photo 1). The other submissions included MDMA (confirmed), psilocin (confirmed), hash, and hash oil (both unconfirmed). The exhibits were seized by the Oregon State Police, Burns Worksite, pursuant to a vehicle stop near Burns (Burns is located in the southeastern quadrant of Oregon). Analysis of an extract by GC/MS, however, indicated not LSD but rather 4-bromo-2-5-dimethoxyamphetamine (commonly abbreviated as DOB). The identification was not confirmed, due to the lack of an authenticated reference standard. The



**Photo 1**

samples were not quantitated; however, the respective concentrations of DOB were judged to be significantly more than the normal concentration of LSD on typical blotter acid, based on the size of the GC peak. This was the first ever submission of DOB (in any form) to the Ontario laboratory.

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**- INTELLIGENCE ALERT -**

**LIQUID OXYCODONE IN DORCHESTER COUNTY, SOUTH CAROLINA**

The Charleston Police Forensic Laboratory (Charleston, South Carolina) recently received 40 small vials each containing a slightly viscous, sticky, yellow liquid with a sweet odor reminiscent of grape flavored cough syrup, alleged to be a liquid pharmaceutical preparation of oxycodone (see small vial in Photo 2). The exhibits were part of a polydrug seizure (vials and four different types of tablets) made in Dorchester County by the Dorchester County Sheriff's Office, pursuant to a traffic violation on Interstate 95. Each vial was clear with a black screw top, and held approximately 1 milliliter of liquid (total net volume 37.5 milliliters). The liquid gave a burnt orange color when treated with the Leiberman reagent. Analysis of a dichloromethane extract by GC/MS and FTIR confirmed oxycodone (not quantitated). This is the first time the laboratory has encountered a liquid preparation of oxycodone. The tablets were identified by imprint codes and GC/MS as various morphine and oxycodone containing pharmaceuticals.



**Photo 2 - The left-hand vial contains the combined solutions collected from all 40 vials.**

\* \* \* \* \*

**- INTELLIGENCE ALERT -**

**ECSTASY MIMIC TABLETS (CONTAINING DEXTROMETHORPHAN)  
IN COLOMBIA, MISSOURI**

The Missouri State Highway Patrol Crime Laboratory (Jefferson City, Missouri) recently received a polydrug seizure that included a small amount of marijuana and two red tablets (total net mass 0.59 gram) with an "M M" logo, suspected MDMA (see Photo 3, next page). The exhibits were seized in Columbia, Missouri by the local Police Department (details of seizure not

available). Color testing gave a negative result with sodium nitroprusside, and a magenta color with the Marquis reagent. Analysis of an extract by GC/MS indicated not MDMA, but rather methorphan (3-methoxy-N-methylmorphinan (not quantitated)). Due to the scheduling differences between dextromethorphan, levomethorphan, and racemethorphan, an optical isomer determination using the trinitrobenzoic acid microcrystalline test\* was performed, and confirmed dextromethorphan [\* See Clarke, Isolation and Identification of Drugs, 1969]. This is believed to be the first ever submission of dextromethorphan tablets to the Missouri laboratory system.



**Photo 3**

\* \* \* \* \*

**- INTELLIGENCE ALERT -**

**ECSTASY MIMIC TABLETS (CONTAINING MDA, CAFFEINE, AND FENTANYL)  
IN ORANGE AND ANAHEIM, CALIFORNIA**

The Orange County Sheriff-Coroner Department, Forensic Science Services Division (Santa Ana, California) recently received two separate tablet submissions, both suspected MDMA. The first submission consisted of four off-white tablets with an "LV" (Louis Vuitton) logo, average net mass 240 - 250 milligrams (see Photo 4). These tablets were seized by the Orange Police Department in Orange, California (circumstances of the seizure not available). The second submission consisted of one white tablet with no discernable logo, mass 205 milligrams (photo not provided). This tablet was seized by the Anaheim Police Department in Anaheim, California (circumstances of the seizure not available). Analysis by GC/MS and GC/IRD, however, indicated not MDMA but rather a mixture of 3,4-methylenedioxamphetamine (MDA), caffeine, and fentanyl (not quantitated) in both submissions. These were the first submissions of this type to the laboratory.



**Photo 4**



**- INTELLIGENCE ALERT -**

**ECSTASY TABLETS CONTAINING TRACE COCAINE AND  
D,L-METHAMPHETAMINE IN EL PASO, TEXAS**

The DEA South Central Laboratory (Dallas, Texas) recently received 185 round, dark green tablets with a dove logo on one side and a raised circular area on the opposite side, 8.5 millimeters in diameter, suspected MDMA (see Photo 5). The exhibits were acquired by a DEA Agent in El Paso, Texas (details not available). The tablets were dark green in color, but appeared to actually contain multiple dyes. Analysis of the tablets (total net mass 59.5 grams) by FTIR, GC/MS, GC/FID, GC/IRD, and HPLC confirmed 3,4-methylenedioxy-methamphetamine (60 milligrams/tablet, calculated as the hydrochloride salt), along with trace (less than one percent) cocaine and d,l-methamphetamine. This was the third submission of MDMA tablets containing from trace to low percentages of cocaine to the South Central Laboratory; however, the two previous submissions each consisted of only a single tablet. The laboratory has had four additional submissions of these same tablets since this initial submission.



**Photo 5**

\* \* \* \* \*

**- INTELLIGENCE ALERT -**

**CHESS TABLE STANDS (FROM GUATEMALA) CONTAINING COCAINE  
IN MIAMI, FLORIDA**

The DEA Southeast Laboratory (Miami, Florida) recently received two chess table stands, each containing a plastic bag of white powder, suspected cocaine (see Photo 6). The exhibits originated in Guatemala, and were seized by Immigration and Customs Enforcement (ICE) personnel following a controlled delivery in Miami. Analysis of the powder (total net mass 2,990 grams) by GC/MS and FTIR confirmed 81 percent cocaine hydrochloride. This is believed to be the first submission of this type to the Miami Laboratory. There were no controlled substances in either of the chess boards or in any of the individual chess pieces.



**Photo 6**

**- INTELLIGENCE ALERT -**

**CHESS PIECES CONTAINING HEROIN IN NEW YORK**

The DEA Northeast Laboratory (New York, New York) recently received 642 plastic chess pieces, average height about 2 inches, each containing a brown powder, suspected heroin (see Photo 7). The exhibits were seized by the New York Drug Enforcement Task Force (location and circumstances of seizure not provided). Analysis of the powder (total net mass 1,958 grams) by GC/FID, GC/MS, and FTIR confirmed 51 percent heroin hydrochloride, along with 26 percent mono-acetylmorphine (positional isomer (O3 versus O6) not determined). This was the first submission of heroin concealed in chess pieces to the Northeast Laboratory. The origin of the exhibits was not provided.



**Photo 7**

\* \* \* \* \*

**- INTELLIGENCE ALERT -**

**TAPESTRY AND PLACE SETTING MATS CONTAINING HEROIN**

The DEA Southwest Laboratory (Vista, California) recently received two tapestry (36 x 24 inches (see Photos 8 and 9)) and eight place setting (18 x 12 inches (see Photo 10, next page)) Agents pursuant to an investigation into a new smuggling technique (location and details not provided in accordance with *Microgram* policy). The mats consisted of three layers: 1) A



**Photo 8**



**Photo 9**



**Photo 10**



**Photo 11**

velvet picture top layer; 2) a rubber-like center layer; and 3) a nonskid textured rubber-like bottom layer (see Photo 11). The top two layers appeared to be professionally fabricated. Analysis of extracts by GC/MS and IR-ATR confirmed heroin hydrochloride in all three layers, with the highest concentration in the middle layer. Quantitative analysis by GC (all three layers combined) indicated 17 percent heroin hydrochloride in the place setting mats and six and seven percent, respectively, in the two tapestry mats. Combined, there was a total net mass of 557.3 grams of heroin hydrochloride in the 10 mats. This is the first submission of this type to the Southwest Laboratory.

\* \* \* \* \*

### **- INTELLIGENCE BRIEF -**

#### **LARGE HEROIN MILL SEIZED IN NEW YORK CITY**

[From the NDIC *Narcotics Digest Weekly* 2005;4(36):1  
Unclassified, Reprinted with Permission.]

On August 15, 2005, members of the New York Organized Crime Strike Force, working in conjunction with the New York Police Department (NYPD) Organized Crime Investigation Division (OCID), dismantled a heroin packaging and distribution organization based at a private residence in the Williamsbridge section of the Bronx. Officers had the private residence under surveillance when they noticed that an individual had circled the block several times in a vehicle and then approached the house on foot carrying a large duffel bag. When officers moved toward the man, he tossed the bag inside the residence and denied any knowledge of the bag or the activities occurring inside the residence. Officers then received consent from an individual in the house to search the property. They discovered that the windows of the house were covered with cardboard, the basement was accessible only through trap doors and ladders located in closets, and electrical lines to the basement were routed through the access ways. In the basement of the house, officers discovered an elaborate heroin milling operation in which Dominican nationals, believed to be low-level employees of a Colombian organization, had established an assembly line to mix, weigh, package, and stamp the heroin. The mill - believed to have been in operation for less than 4 weeks - operated around the clock. The Dominican



packagers reportedly were paid \$1,000 per week and were not permitted to leave the residence. Officers arrested 13 Dominican nationals who subsequently were charged with federal narcotics trafficking and firearms offenses. If convicted, each could face a sentence of 15 years to life in prison. Additionally, Task Force officers seized 50 kilograms of heroin (47 kilograms of which had been processed for retail distribution), 1 pound of Mexican black tar heroin, approximately \$250,000, two money-counting machines, and seven handguns. Officers also seized heroin processing and packaging supplies, including 21 cases of glassine envelopes, 150 coffee grinders that had been used to cut and mix the drugs, waffle irons that had been used to make the glassine packaging pliable, rolls of tape, and 57 rubber stamps for labeling the heroin. The stamps had logos such as Black Flag, Fully Loaded, Cancer, Resident Evil, and Kill Zone. The investigation is ongoing. The Strike Task Force is composed of agents from the Drug Enforcement Agency (DEA), NYPD, New York State Police (NYSP), U.S. Immigration and Customs Enforcement (ICE), Federal Bureau of Investigation (FBI), and Internal Revenue Service (IRS).

NDIC Comment: This is the largest heroin mill seized in New York City in the last decade. Heroin mills were common in the 1970s and 1980s when the demand for heroin was much higher than it has been over the past decade. However, anecdotal reporting indicates that heroin is readily available in New York City and that abuse is increasing. Increased heroin demand may result in traffickers reestablishing large milling operations.

\* \* \* \* \*

#### **- INTELLIGENCE BRIEF -**

#### **LARGE MODEL ROCKET (SEIZED FROM A VEHICLE IN MISSOURI) USED TO CONCEAL - AND POTENTIALLY DISCARD - ICE METHAMPHETAMINE**

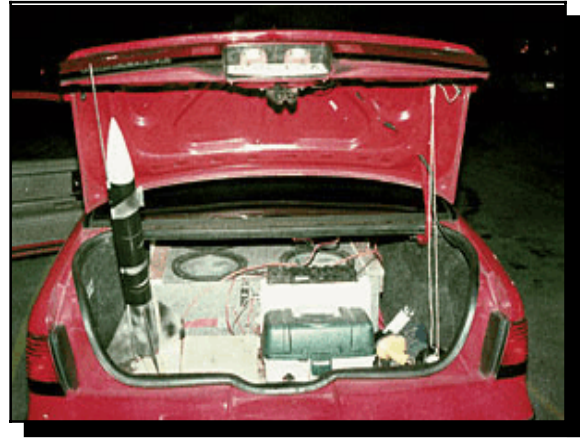
[From the NDIC *Narcotics Digest Weekly* 2005;4(36):2  
Unclassified, Reprinted with Permission.]

On July 15, 2005, the U.S. Attorney for the Western District of Missouri announced the federal grand jury indictment of two Kentucky men on charges that they had conspired to distribute methamphetamine. The two Caucasian males had obtained ice methamphetamine from Mexican sources of supply in Omaha (NE) and were transporting the drugs to Louisville (KY) for distribution. The men concealed the ice methamphetamine in the body of a motorized, 3-foot hobby rocket connected by wires to the vehicle's cigarette lighter (see Photo 12). If stopped by law enforcement officers en route to their destination, they planned to open the trunk of the vehicle, raise the methamphetamine-filled



**Photo 12**

rocket into launching position using a string and pulley system, and launch the rocket into the air (see Photo 13). The two men had tested a similar rocket filled with 2 pounds of gravel that reached a height of about 1,200 feet and, based on the results of that test, expected the plastic bags containing the ice methamphetamine to melt or disintegrate and the drugs to scatter into the air. On June 24, 2005, the men had an opportunity to test their device when a Missouri State Highway Patrol (MSHP) trooper attempted to stop their vehicle on Interstate 70 in Callaway County. The vehicle exited the interstate and entered a restaurant parking lot; however, the two men



**Photo 13**

failed to activate the rocket. The driver then fled the vehicle and discarded a small bag containing approximately 2 grams of methamphetamine, while the passenger remained in the vehicle. The trooper and a backup officer apprehended the men, searched the vehicle, and discovered the rocket as well as devices that appeared to be pipe bombs hidden in the trunk. Officers with the MSHP bomb squad and the Bureau of Alcohol, Tobacco, Firearms and Explosives (ATF) were called to the scene and determined that the devices were PVC pipes constructed to resemble pipe bombs. Officers seized 2 pounds of ice methamphetamine concealed in the hobby rocket, the 2 grams of methamphetamine that the driver had tossed after fleeing the vehicle, 38 grams of ice methamphetamine that had been concealed in the three PVC pipes, and 14 grams that had been concealed in a false-bottomed can, as well as 105 hydrocodone, 41 Viagra (sildenafil citrate), 39 Xanax (alprazolam), 32 Cialis (tadalafil), and 7 Klonopin (clonazepam) tablets, and \$13,534.

NDIC Comment: Drug distributors often use creative methods to conceal drugs during transportation but rarely develop such an elaborate means of discarding the drugs in the event of law enforcement interdiction. This scheme indicates the extent to which traffickers will go to protect drug shipments.

\* \* \* \* \*

#### **- INTELLIGENCE BRIEF -**

### **CANNABIS GROW SITE SEIZED ON BLM PROPERTY WEST OF CEDAREDGE, COLORADO**

[From the NDIC *Narcotics Digest Weekly* 2005;4(37):3  
Unclassified, Reprinted with Permission.]

On August 3, 2005, law enforcement officers seized a cannabis grow site containing 3,100 plants west of Cedaredge on Bureau of Land Management (BLM) property. Colorado Air National Guard (CANG) personnel discovered the operation during a routine fly-over. The plants were in various stages of growth and ranged from 3 to 6 feet in height; they were located among juniper

trees on approximately one-half of an acre. Law enforcement officers discovered that water from a nearby stream had been gravity fed to the plants via a system of plastic pipes. Officers also discovered three campsites near the cannabis grow site, and because of the number of discarded cannabis stalks covering a wide area near the camps, investigators speculate that the site had been in operation for several years. Investigators believe that as the plants matured, the buds and leaves were stripped from the stalks and transported to another location for processing. Two semiautomatic handguns, a pistol, and several boxes of ammunition also were discovered in a tent at one of the campsites. Personnel from the Delta County Sheriff's Office; U.S. Department of the Interior, BLM; and U.S. Department of Agriculture, National Forest System (NFS) also participated in the investigation.

NDIC Comment: Mexican DTOs often establish cannabis grow sites on federal lands throughout the United States, and such activity has been increasing over the past several years in Colorado. For example, approximately 5,000 cannabis plants were seized in 1997 from private property approximately 1 mile from the August 3 seizure site; 7,000 cannabis plants were seized on the same section of private property in September 2000; and 10,000 cannabis plants were seized in August 2002 on BLM property near Gateway, Colorado.

\* \* \* \* \*

## SELECTED REFERENCES

[Selected references are a compilation of recent publications of presumed interest to forensic chemists. Unless otherwise stated, all listed citations are published in English. Listed mailing address information (which is sometimes cryptic or incomplete) exactly duplicates that provided by the abstracting services. Patents are reported only by their *Chemical Abstracts* citation number.]

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  8. Maresova V, Hampl J, Chundela Z, Zrcek F, Polasek M, Chadt J. **The identification of a chlorinated MDMA.** *Journal of Analytical Toxicology* 2005;29(5):353. [Editor's Notes: The unknown was detected in a urine sample, and was tentatively identified as 6-chloro-MDMA. Contact: Institute of Forensic Medicine and Toxicology, First Medical Faculty and Hospital, Charles University of Prague, Czech Rep.]
  9. Moldvai I, TemesvariMajor E, Ineze M, Domyei G, Szentirmay E, Szantay C. **Synthetic route to ergot alkaloids.** *Helvetica Chimica Acta* 2005;88(6):1344. [Editor's Notes: An overview, including three synthetic pathways to the ergolines. Contact: Hungarian Acad Sci, Inst Biomol Chem, Chem Res Ctr, POB 17, H-1525 Budapest, Hungary.]
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  13. Weinberger R. **Implementing Capillary electrophoresis in a controlled environment: An interview with Ira Lurie of the DEA.** *American Laboratory* 2005;37:6. [Editor's Notes: A conversational overview of the use of CE for the analysis of controlled substances in forensic laboratories. Contact: CE Technologies, Inc., P.O. Box 140, Chappaqua, NY 10514.]

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## THE JOURNAL/TEXTBOOK COLLECTION EXCHANGE

There were no offerings made during the past quarter.

**All subscribers are encouraged to donate surplus or unwanted items or collections; if interested, please consult the *Microgram* website or contact the *Microgram* Editor for further instructions.**

The next offering of journals and textbooks will be in the January 2006 issue of *Microgram Bulletin*.

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## THE DEA FY - 2006 STATE AND LOCAL FORENSIC CHEMISTS SEMINAR SCHEDULE

The FY - 2006 schedule for the DEA's State and Local Forensic Chemists Seminar is as follows:

November 14 - 18, 2005  
February 6 - 10, 2006  
May 8 - 12, 2006  
July 10 - 14, 2006  
September 11 - 15, 2006

Note that the school is open only to forensic chemists working for law enforcement agencies, and is intended for chemists who have completed their agency's internal training program and have also been working on the bench for at least one year. There is no tuition charge for this course. The course is held at the AmeriSuites Hotel in Sterling, Virginia (near the Washington/Dulles International Airport). A copy of the application form is reproduced on the last page of the August 2004 issue of *Microgram Bulletin*. Completed applications should be mailed to the Special Testing and Research Laboratory (Attention: Pam Smith or Jennifer Kerlavage) at: 22624 Dulles Summit Court, Dulles, VA 20166. For additional information, call 703/668-3337.

\* \* \* \* \*

## EMPLOYMENT OPPORTUNITIES

### 1. U.S. Drug Enforcement Administration

(Second Posting)

**Position:** Forensic Chemist (Up to 10 Positions Available)

**Location:** Dallas, Texas

**Salary Range:** \$32,084 (GS-5) - \$67,033 (GS-11) - Promotional potential to GS-13

**Application Deadline:** Open Until Filled

**Detailed Information and Application:** <https://www.avuedigitalservices.com/dea/applicant.html>

**Vacancy Announcement Number:** DEA-SCLAB-05-0297-MP (Merit Promotion) or DEA-SCLAB-05-0297-DEU (All Others)

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### 2. U.S. Drug Enforcement Administration

(Second Posting)

**Position:** Fingerprint Specialist (1 Position Available)

**Location:** San Francisco, California

**Salary Range:** \$57,178 - \$105,939

**Application Deadline:** Open Until Filled

**Detailed Information and Application:** <https://www.avuedigitalservices.com/dea/applicant.html>

**Vacancy Announcement Number:** DEA-WEST-05-0293-MP (Merit Promotion) or DEA-WEST-05-0293-DEU (All Others)

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# Computer Corner

## Computer Forensic Jargon to Avoid

# #199

by Michael J. Phelan  
DEA Digital Evidence  
Laboratory

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In the last edition of Computer Corner (#198), a list of simple phrases and short technical definitions was provided for a number of computer forensic terms that are commonly used in report writing and in courtroom testimony. This edition will address a related issue: Technical jargon that should be avoided because the term: 1) Has no agreed-upon meaning within the computer forensic community; 2) is redundant; 3) is overly technical; 4) misrepresents the facts; or 5) is proprietary.

As the Digital Evidence field has expanded, its practitioners have developed specialized terminology to describe various aspects of their work. However, some technical terms were adopted for common use without considering their precise meaning, or are improper uses or adaptations of proprietary names. Inappropriate use of certain terms can cause confusion among the recipients of digital evidence reports (investigators, attorneys, and jurors) - or more importantly can be negatively exploited in a courtroom setting by the defense. The following is a list of technical jargon that should be avoided:

**Bit Stream:** This term refers to a sequential copying of all of the bits on the media. Related terms include “bit stream copy” and “bit stream image”. Other copy terminology such as “copy”, “duplicate”, or “image” is both more accurate and linguistically more intelligible.

**Cache:** This term has multiple meanings, including different hard drive storage areas such as the swap or page file (a temporary memory storage area), or the temporary Internet files used to refresh a webpage directly from the hard drive (that is, to avoid having to download the data from scratch (reducing network access)). The term is frequently used by computer forensic examiners to denote some type of temporary data storage. However, the use of the term “cache” without additional hard drive storage location explanation is generic, and does not provide the level of specificity that is expected in a digital evidence forensic report, examiner notes, or courtroom testimony.

**Carved:** This term refers to a process that uses a set of file headers and footers to search for data that meets the specified search pattern parameters. The term implies that information is “carved” out of the media being searched (implying it is somehow removed). This is vague and confusing, especially for non-computer forensic personnel, and should be avoided. The use of the phrase “recovered” is preferable.

**dd:** This term refers to the Unix command that copies data. However, the number of options under this command are extensive, so “copy” is a more preferable term. The examination notes should show those options that were actually used, but the reporting and testimony should be kept simple.

**Exact Duplicate:** As defined in the Federal Rules of Evidence, a duplicate is an exact representation of the original. Therefore, the term “exact duplicate” is redundant.

**Forensic Copy:** This term has no accepted definition. It implies that a copy was authenticated for use in digital evidence forensics. However, no common definition exists which differentiates a “forensic copy” from the more accepted terms of “logical copy”, “physical copy”, “duplicate”, or “image”.

**Forensic Wipe:** This term is synonymous with the term “data erasing”. It involves the overwriting of existing data storage locations (containing data) with a new pattern of zeros and ones. Wipe software technology often wipes each storage location multiple times to ensure that none of the original data remains. However, the term “forensic wipe” does not have any agreed standard that specifies the number of required overwrites. It should therefore be avoided because it lacks specificity, yet implies that the wipe is “forensically” sound. There is a data erasing standard commonly referred to as a “DoD Wipe”. The Department of Defense (DoD) has published the number of required overwrites minimally necessary for various levels of classified information. The higher the level of security classification, the more overwrites (wipes) that are required before the data is considered fully erased or non-recoverable.

**Ghosted:** This is another term sometimes used to denote a copy of an original. The term’s origin is probably the copy software marketed by Symantec Corporation under the name of “Ghost”. However, the Ghost software contains many options, some of which affect the robustness (type and reliability) of the copy. Therefore, the meaning of the phrase “ghosted” or “ghost copy” is not specific, and it is inappropriate for use in a forensic report or testimony. Again, the term “copy” is preferable in both report writing or testimony, because it is simple and covers all forms of duplications.

**Mirror Image:** The term “image” is used by computer forensic examiners to denote a file (or group of files) that contains an exact representation of the original data (often stored in a proprietary format). A “mirror image” is a frequently used computer forensic term, and is meant to denote an “exact copy” or “reflection” of the original. However, the term is not a proper analogy, because a mirror image is actually a reverse image - not a true copy. Again, the term “image” (by itself) is fully explanatory of this type of copy.

**Sterile Media** (also sometimes referred to as “Blank Media”): This term is sometimes used to denote storage media that does not contain any data. However, all magnetic media consists of a magnetic flux state, at all storage locations, at all times. Thus, no magnetic media can be considered to be “sterile” or “blank”, because every storage bit location at every sector contains either a high or low magnetic flux, commonly referred to as a zero (low magnetic flux) or a one (high magnetic flux). Therefore, the term “wiped media” is recommended to denote storage media that does not contain any *meaningful* data that was inputted by a user - either because it is brand new, or because it has been wiped by a user.

**Tarred:** This term refers to a very common Unix data compression algorithm. The use of the term “compressed” is preferred, because it covers any type of data compression software.

**Zipped:** The term refers to two common data compression software products - PK Zip or PK Lite. Again, the use of the term “compressed” is preferred.

The digital evidence community (through the Scientific Working Group on Digital Evidence (SWGDE)) has provided some guidance with regard to technical definitions in its April 25, 2005 draft entitled: *Digital Multimedia Evidence Glossary Version 1.0* ([www.swgde.org](http://www.swgde.org)). However, the discipline is still relatively new, and so few recognized technical definitions exist. As an interim strategy for laboratory management, a best practice would be to include a glossary in the laboratory’s standard operating procedures that defines all commonly utilized terms that are not covered by current, standard information technology definitions. Additionally, the use of technical terms or jargon to be avoided, as well as a policy that addresses the use of propriety names or terms in official documents, should be considered in the laboratory’s training program. The long term goal is to have a uniform approach to correctly and clearly describe the processes of how digital evidence was handled and examined.

Questions or comments? E-mail: [Michael.J.Phelan-usdoj.gov](mailto:Michael.J.Phelan-usdoj.gov)

# Microgram

## *Bulletin*

**Published by:**

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Office of Forensic Sciences  
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**VOL. XXXVIII, NO. 11**

**NOVEMBER 2005**

**- SAFETY ALERT -**

**BULK MARIJUANA IN HAZARDOUS PACKAGING IN CHICAGO, ILLINOIS**

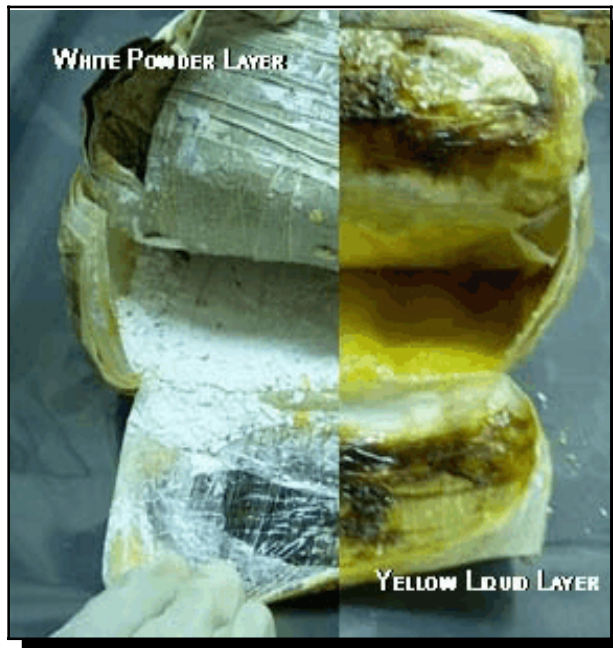
The Illinois State Police Forensic Science Center at Chicago recently received five large, plastic-wrapped bundles of plant material, suspected marijuana. The exhibits were randomly selected from a total of 395 such bundles that had been seized by the Chicago Police from a hidden compartment in a tractor trailer arriving in Chicago from St. Louis. The packaging appeared to be routine, and consistent with similar, previously encountered bundles (see Photo 1). However, upon opening the first bundle, a white powdery substance was found between layers of the plastic wrapping, and as the plastic was folded back to remove the plant material, a liquid substance dripped from the packaging and onto the powder, resulting in an effervescent reaction that produced a gas with a chlorine-type odor. The evidence was transferred to a ventilated area for further investigation, where careful dissection revealed



**Photo 1**



the following (outside to inside): Plastic wrap; white powder; plastic wrap; sticky, yellow to brown liquid; plastic wrap; white powder; plastic wrap; plant material (see Photo 2). The liquid had a pH of around 2 (not further identified). Analysis of the powder with FTIR and GC/MS indicated a chlorinated compound (not further identified). Analysis of the plant material (total gross mass (including packaging) approximately two tons) by microscopy and Duquenois-Levine confirmed marijuana. Due to the hazardous nature of the sample, it was immediately destroyed under court order. Investigative intelligence suggested that the shipment originated in Mexico. This was the laboratory's first encounter with hazardous packaging of this nature.



**Photo 2**

[Editor's Notes: The white powder was suspected to be a pool chlorinating compound. It is unknown whether this packaging was intended to harm, or rather was to eliminate odors (thereby reducing the possibility of detection by canines or trained law enforcement personnel).]

\* \* \* \* \*

### **- INTELLIGENCE ALERT -**

### **HEROIN "FINGERS" IN MONTPELIER, VERMONT**

The Vermont Forensic Laboratory (Waterbury) recently received nine hexagonally shaped objects (approximately 40 x 10 millimeters), each individually wrapped in plastic and containing on average 4.7 grams of compressed tan powder, suspected heroin (see Photo 3). The exhibits were seized in Montpelier in a joint operation by the Montpelier and Berlin Police Departments. These unusually shaped objects are occasionally referred to as "fingers". Analysis by GC/MS confirmed heroin (not quantitated, but fairly high purity based on the chromatography and lack of adulterants). Although the laboratory has previously encountered heroin "fingers", this was the first such submission in many years.



**Photo 3**

**- INTELLIGENCE ALERT -**

**COCAINE CYLINDERS IN SHELBYVILLE, KENTUCKY**

The Kentucky State Police Central Forensic Laboratory (Frankfort) recently received two large ziplock bags, each containing several dozen cylinders of off-white, compressed powder, suspected cocaine (see Photo 4). The exhibits were acquired in Shelbyville by the Kentucky State Police (Shelbyville is located west of Frankfort (east of Louisville)). The cylinders measured approximately 3.8 centimeters in length and 1.9 centimeters in diameter (averages), and had an average weight of approximately



**Photo 4**



**Photo 5**

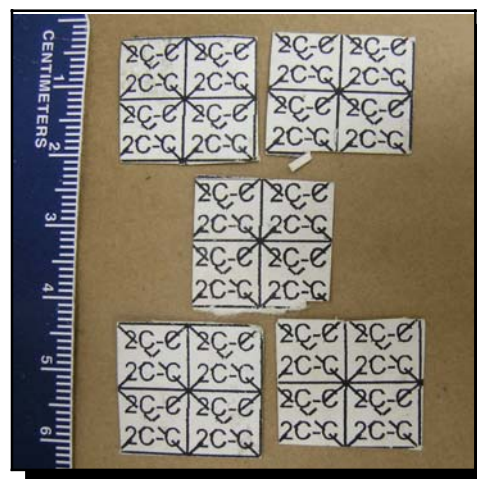
10 grams (see Photo 5). Analysis of the powder (total net mass 1,500 grams) by GC-MS, GC-FID, and IR confirmed cocaine hydrochloride (not quantitated). Investigative intelligence indicated that these cylinders were originally smuggled into the U.S. from Mexico inside C-cell battery casings. This was the first submission of this type to the laboratory.

\* \* \* \* \*

**- INTELLIGENCE ALERT -**

**LSD BLOTTER ACID MIMIC CONTAINING 4-CHLORO-2,5-DIMETHOXY-PHENETHYLAMINE (2C-C) IN WASHINGTON COUNTY, OREGON**

The Oregon State Police Portland Metro Laboratory (Clackamas) recently received five small, rectangular pieces of card stock with black print on both sides, apparent LSD “blotter acid” but submitted as an unspecified “controlled substance/chemical”. The exhibit was seized by the Washington County Sheriff’s Office (circumstances unknown; Washington County is in the northwest quadrant of Oregon). The pieces were about 1.6 x 2 centimeters and were further divided into four smaller areas (each about 0.9 x 1 centimeters). Each area had “2C-C” printed on one side and portions of what appeared to be organic synthesis instructions on the reverse (see Photos 6 and 7). 2C-C is an informal abbreviation for 4-chloro-2,5-dimethoxyphenethylamine,



**Photo 6**





**- INTELLIGENCE ALERT -**

**VARIOUS CONSUMER PRODUCTS CONTAINING MARIJUANA/THC  
IN SAN LORENZO, CALIFORNIA**

The DEA Western Laboratory (San Francisco, California) recently received several exhibits of apparent consumer products suspected to contain marijuana or THC. The exhibits were seized by Alameda County Sheriff officers and DEA agents from a residence in San Lorenzo, California (San Lorenzo is located approximately 15 miles southeast of Oakland). Many of the exhibits were marked for “medical use”, and so were suspected to be associated with the “medical marijuana” outlets in the Bay Area. The exhibits included plant material, various “medical use” products, a marijuana sifting device, and glass cooking dishes (e.g., see Photos 9 - 12 (other items not shown)). Analysis by GC/MS confirmed the presence of THC in the plant materials, “medical use” products, and residues (quantitations not performed). The Western Laboratory has received similar products in the recent past, but not items that appeared to be commercially produced and labelled (including “nutritional” information).



**Photo 9 - Wooden Sifter/Screen  
(Contained Marijuana Residue)**



**Photo 10 - “Buzz Oil”**



**Photo 11 - “Pot Butter”**



**Photo 12 - “Budtella”**

**- INTELLIGENCE ALERT -**

**HEROIN SAMPLES CONTAINING DIMETHYL SULFONE (CHICAGO, ILLINOIS)  
AND DILTIAZEM (NEW BRITAIN, CONNECTICUT)**

The DEA Special Testing and Research Laboratory (Dulles, Virginia) recently received two unusual heroin exhibits from Chicago, Illinois and New Britain, Connecticut (details of seizures not provided). The first consisted of 2.4 grams of white powder; analysis by GC/FID, GC/MS, and NMR confirmed 21 percent heroin hydrochloride and 11 percent dimethyl sulfone. The second consisted of 0.56 grams of white powder; analysis (same techniques) confirmed 36 percent heroin hydrochloride and 6 percent diltiazem. Dimethyl sulfone is commonly found as an adulterant in methamphetamine, but is rarely encountered in heroin. Similarly, diltiazem has been previously reported as an adulterant in cocaine, but is also rarely encountered in heroin. Signature analysis determined that both samples were of South American origin.

\* \* \* \* \*

**- INTELLIGENCE ALERT -**

**EARLY WARNING - MDMA AND MDA PRODUCERS USING  
*OCOTEA CYMBARUM* AS A PRECURSOR**

[From the NDIC *Narcotics Digest Weekly* 2005;4(41):1  
Unclassified, Reprinted with Permission.]

Forensic chemists have reported that *Ocotea cymbarum* has been discovered at several clandestine laboratories in the Northeast. *Ocotea cymbarum* is an essential oil - distilled from the trunk bark of a tropical tree native to Brazil, Colombia, and Paraguay - that typically contains between 80 and 94 percent safrole, a precursor for MDMA (3,4-methylenedioxymethamphetamine, also known as ecstasy) and MDA (3,4-methylenedioxyamphetamine). *Ocotea cymbarum* also is known as Brazilian sassafras oil but is sold under other names and spellings such as *Ocotea cymbarum* oil, *Ocotea cynbarnum*, *Ocotea cymbarium*, and "Oil of Ocotea."

MDMA and MDA producers are using *Ocotea cymbarum* because the importation and distribution of other precursors and sources of precursors - such as safrole and other essential oils containing safrole, including sassafras oil and camphor oil - have been monitored heavily by law enforcement. In the United States, safrole and essential oils rich in safrole are List I chemicals under the Controlled Substances Act. All distributors must be registered with the Drug Enforcement Administration (DEA). Additionally, it is unlawful for any person to possess or distribute a listed chemical knowing, or having reasonable cause to believe, that the listed chemical will be used to manufacture a controlled substance. Law enforcement advisories regarding safrole and essential oils rich in safrole typically have not yet specified *Ocotea cymbarum*.

*Ocotea cymbarum* is available via the Internet, including at online auction sites, and through mail order from chemical, aromatherapy, and perfume companies. Some criminal groups and

independent manufacturers have illegally diverted *Ocotea cymbarum* from domestic businesses that import large quantities of the oil for legitimate industrial uses, which include the manufacture of fragrances, flavoring agents, and insecticides. A clandestine MDMA laboratory seized recently in New Jersey contained a 5-gallon drum of *Ocotea cymbarum* that apparently was obtained from an aromatherapy company in the United States. Using a precursor of this quantity could have yielded an estimated 49,000 to 108,000 tablets containing 120 milligrams of MDMA, depending on the method of manufacture.

*Ocotea cymbarum* is most commonly sold via the Internet in 100-milliliter and 500-milliliter quantities; a 500-milliliter bottle of *Ocotea cymbarum* sells for \$20 to more than \$100. An MDMA producer with access to the proper chemicals can use a 500-milliliter quantity of *Ocotea cymbarum* to produce an estimated 1,300 to 2,800 tablets containing 120 milligrams of MDMA.

Law enforcement agencies encountering suspicious sales of *Ocotea cymbarum* should access DEA's advisory on safrole and essential oils rich in safrole at [www.deadiversion.usdoj.gov/chem\\_prog/advisories/safrole.htm](http://www.deadiversion.usdoj.gov/chem_prog/advisories/safrole.htm).

\* \* \* \* \*

### **- INTELLIGENCE ALERT -**

### **LARGEST MDMA LABORATORY SEIZURE IN INDIANA HISTORY**

[From the NDIC *Narcotics Digest Weekly* 2005;4(41):2  
Unclassified, Reprinted with Permission.]

On June 22, 2005, the St. Joseph County Metro Special Operations Unit and members of the DEA Merrillville Resident Office Task Force seized a fully functioning MDMA laboratory and 80 grams of the drug in South Bend. Three Caucasian males were arrested and charged with conspiracy to manufacture and distribute the drug. The laboratory operators leased office space in a former factory building and were operating the laboratory in a 700-square-foot room that was equipped with water, electricity, heat, air conditioning, and drive-in access. One of the suspects, who is cooperating with law enforcement, reported that the three men had manufactured three batches of tablets - in quantities of 6,000, 10,000, and 13,000 - immediately before the seizure. The men had produced 15,000 to 25,000 tablets every 7 to 10 days, the majority of which were sent to Georgia and Texas for distribution; however, a small quantity was sold in the South Bend area. The men began producing blue gelatin capsules containing MDMA in 2004; in March 2005 they acquired a tablet press and manufactured 6,000 to 7,200 gray tablets per hour. Three undercover purchases of MDMA were made prior to the laboratory seizure - 20 capsules in October 2004, 100 capsules in February 2005, and 500 tablets in March 2005. During the last undercover purchase on the day of the laboratory seizure, undercover officers bought 5,000 MDMA tablets for \$6 each. Investigators determined that many of the chemicals used at the laboratory had been obtained via the Internet; the men had purchased safrole from suppliers in Canada and other chemicals from suppliers in China.

(Continued Next Page)



NDIC Comment: This MDMA laboratory, with a production capacity of 2 to 9 pounds, is the largest laboratory seized in Indiana as of the date of this publication. According to the EPIC National Clandestine Laboratory Seizure System (NCLSS), four MDMA laboratories were seized in Indiana between 2000 and 2005. NDIC National Drug Threat Survey (NDTS) 2003 and 2004 respondents in South Bend reported that MDMA availability was low to moderate. NDTS results also reveal that demand for the drug in northern Indiana, specifically in South Bend, has decreased; however, much of the MDMA produced in the aforementioned laboratory reportedly was transported to areas of higher demand.

\* \* \* \* \*

**- INTELLIGENCE BRIEF -**

**VERY LARGE SEIZURE OF MDMA TABLETS  
IN CANADIAN COUNTY, OKLAHOMA**



**Photo 13**

The Oklahoma State Bureau of Investigation's Central Drug Lab (Oklahoma City) recently received a submission of over 200,000 tablets (total net mass 136 pounds), suspected Ecstasy (see Photo 13). The exhibits were seized pursuant to a vehicle stop on Interstate 40 in Canadian County (surrounding Oklahoma City) by Oklahoma Bureau of Narcotics personnel (details not provided in accordance with *Microgram* policy). The vehicle was allegedly travelling from California to Louisiana. The tablets were packaged in 40 plastic bags, which were further contained inside a rolling suitcase and a duffel bag. Each bag contained approximately 5,042 tablets. The tablets had typical Ecstasy tablet weights and dimensions, were in three colors, and had various logos: There were blue tablets with either a "star", "Superman", or "Motorola" logo; green tablets with either a "Mercedes", "Playboy bunny", or "Motorola" logo; and light purple tablets with a "smiley face" logo (closeup photos not available). Analysis of selected tablets by GC and GC/MS confirmed 3,4-methylenedioxymethamphetamine (not quantitated). Caffeine and procaine were also identified in some of the tablets. This was the laboratory's largest submission of Ecstasy tablets in at least 10 years, and may be the largest in laboratory and state history.

\* \* \* \* \*

## - INTELLIGENCE BRIEF -

### RECORD SUBMISSION OF HEROIN TO THE DEA MID-ATLANTIC LABORATORY

The DEA Mid-Atlantic Laboratory (Largo, Maryland) recently received a two-exhibit submission, the first consisting of 29 duct-tape wrapped packages each containing one kilogram of a fine tan powder, suspected heroin (see Photo 14), and the second consisting of 25 duct-tape wrapped packages each containing one kilogram of a white powder, suspected cocaine. The exhibits were originally seized in Quito, Ecuador and were submitted for analysis after a controlled delivery in northern Virginia (further details not available). Analysis of the tan powder by GC, GC/MS, and ATR-FTIR confirmed 72 percent heroin hydrochloride. Analysis of the white powder (same techniques) confirmed 72 percent cocaine hydrochloride. This was the largest ever heroin submission to the Mid-Atlantic Laboratory. The exhibits in this case were traced back to the Revolutionary Armed Forces of Colombia (FARC).



Photo 14

\* \* \* \* \*

### SELECTED REFERENCES

[Selected references are a compilation of recent publications of presumed interest to forensic chemists. Unless otherwise stated, all listed citations are published in English. Listed mailing address information (which is sometimes cryptic or incomplete) exactly duplicates that provided by the abstracting services. Patents are reported only by their *Chemical Abstracts* citation number.]

1. Ebejer KA, Brereton RG, Carter JF, Ollerton SL, Sleeman R. **Rapid comparison of diacetylmorphine on banknotes by tandem mass spectrometry.** Rapid Communications in Mass Spectrometry 2005;19(15):2137. [Editor's Notes: Presents the title study. Contact: Mass Spec Analytical Ltd., Bristol, UK BS99 7AR.]
2. Caldicott DGE. **Clandestine drug laboratories in Australia and the potential for harm.** Australian and New Zealand Journal of Public Health 2005;29(2):155. [Editor's Notes: No abstract or contact information was provided.]
3. Khasanov U, Rasulev U, Usmanov D, Iskhakova S, Nabiev U. **Application of surface ionization methods for highly sensitive and selective analysis of benzodiazepine derivatives.** Journal of Pharmaceutical and Biomedical Analysis 2005;37(5),Sp. Iss. S1:1125. [Editor's Notes: The title technique was applied to medazepam, diazepam, and chlordiazepoxide. Contact: Arifov Inst. Elect., Tashkent 700125, Uzbekistan.]

4. Lee DYW, Ma ZZ, LiuChen LY, Wang YL, Chen Y, Carlezon WA, Cohen B. **New neoclerodane diterpenoids isolated from the leaves of *Salvia divinorum* and their binding affinities for human kappa opioid receptors.** *Bioorganic & Medicinal Chemistry* 2005;13(19):5635. [Editor's Notes: 10 known and 3 previously unknown terpenoids were isolated by bioactivity-guided fractionation. Contact: Harvard Univ., Sch. Med., McLean Hosp., Mol. Pharmacol. Lab, 115 Mill St., Belmont, MA 02478.]
  
5. Mile B. **Chemistry in court.** *Chromatographia* 2005;62(1/2):3. [Editor's Notes: A review. Includes a review of the analysis of drugs of abuse by GC, GC/MS, GC/FTIR, HPLC, chiral chromatography, CE, CEC, and SPME. Contact: School of Chemistry, University of Bristol, Bristol, UK BS8 1TS.]
  
6. Mohana M. **Principal opium alkaloids as possible biochemical markers for the source identification of Indian opium.** *Journal of Separation Science* 2005;28(13):1558. [Editor's Notes: 124 licit opium samples were analyzed for thebaine, codeine, morphine, papaverine, and narcotine, using CZE without derivatization or purification. Contact: Department of Biochemistry, University College of Science, Osmania University, Hyderabad, India.]
  
7. Phinney KW, Ihara T, Sander LC. **Determination of ephedrine alkaloid stereoisomers in dietary supplements by capillary electrophoresis.** *Journal of Chromatography A* 2005;1077(1):90. [Editor's Notes: Three different CE methods were used to analyze five reference standards of ephedra. Contact: NIST, Chem. Sci. & Technol. Lab., Analyt. Chem., 100 Bur. Dr., Stop 8392, Gaithersburg, MD 20899.]
  
8. Rodionova OY, Houmoller LP, Pomerantsev AL, Geladi P, Burger J, Dorofeyev VL, Arzamastsev AP. **NIR spectrometry for counterfeit drug detection.** *Analytica Chimica Acta* 2005;549(1-2):151. [Editor's Notes: Includes multivariate hyperspectral image analysis to differentiate counterfeit preparations. Contact: Semenov Institute of Chemical Physics, Kosygin 4, Moscow 119991, Russia.]
  
9. Rothchild R. **Proton and carbon-13 NMR studies of some tryptamines, precursors, and derivatives: Ab initio calculations for optimized structures.** *Spectroscopy Letters* 2005;38(4-5):521. [Editor's Notes: Presents the title study on 3 tryptamines and 1 precursor. Contact: John Jay College of Criminal Justice, Science Department, The City University of New York, New York, NY (zip code not provided).]
  
10. Wang S-M. **Enantiomeric determination of amphetamines: Exploring a novel one-step solid-phase microextraction-based approach.** *Journal of Chromatography B: Analytical Technologies in the Biomedical and Life Sciences* 2005;825(1):79. [Editor's Notes: (S)-(-)-N-Trifluoroacetylpropyl chloride was added directly to the sample matrix (containing amphetamine or methamphetamine), and the resulting derivatives were isolated via SPME and analyzed via SIM mass spectrometry. The matrices were not specified (may be biological). Contact: Dept. of Forensic Science, Kuei-Shan, Central Police University, Taoyuan, Taichung 33304.]
  
11. Wang S-M, Lewis RJ, Canfield D, Li T-L, Chen C-Y, Liu RH. **Enantiomeric determination of ephedrine and norephedrine by chiral derivatization gas chromatography - mass spectrometry approaches.** *Journal of Chromatography B: Analytical Technologies in the Biomedical and Life Sciences* 2005;825(1):88. [Editor's Notes: The title technique was applied to 8 phenethylamines, including (+) and (-)-cathinone. Derivatization was accomplished with (-)- $\alpha$ -methoxy- $\alpha$ -trifluoromethylphenylacetic acid (MTPA). Contact: Central Police University, Taoyuan, Taiwan.]

### Additional References of Possible Interest:

1. Smyth WF. **Recent studies on the electrospray ionisation mass spectrometric behaviour of selected nitrogen-containing drug molecules and its application to drug analysis using liquid chromatography-electrospray ionisation mass spectrometry.** Journal of Chromatography B: Analytical Technologies in the Biomedical and Life Sciences 2005;824(1-2):1. [Editor's Notes: A review. Focus appears to be on biological matrices. The nitrogen-containing drugs were not specified in the abstract. Contact: Univ. Ulster, Sch. Biomed. Sci., Coleraine BT52 1SA, Londonderry, North Ireland.]
2. Song Y, Zhang Q, Hu Y-q, Deng C. **Quantitative determination of ethyl-p-hydroxybenzoate in resins extracted from *Dracaena cochinchinensis* with two technologies.** Zhongguo Zhongyao Zazhi 2004;29(4):323. [Editor's Notes: *Dracaena cochinchinensis* is a source for "Dragon's Blood". The title compound was isolated with TLC and analyzed by HPLC. This article is written in Chinese. Contact: Medical College of Chinese People's Armed Police Forces, Tianjin 300162, Peop. Rep. China.]

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### NEW EMAIL ADDRESSES NEEDED

The email addresses for the following organizations returned rejection notices to the *Microgram* Editor for at least the past three issues of *Microgram Bulletin*, and therefore the respective organizations have been dropped from the subscription list. Note that the errors include "mailbox full", "over quota", "user not found", or "user unknown" messages, and also a variety of anti-spam/filtering messages (the latter resulting from failure to "whitelist" the [microgram\\_editor@mailsnare.net](mailto:microgram_editor@mailsnare.net) address). The *Microgram* Editor requests your assistance in contacting these organizations, determining if they wish to remain on the *Microgram* subscription e-net, and if so asking them to forward a valid email address to the [microgram\\_editor@mailsnare.net](mailto:microgram_editor@mailsnare.net) address.

#### Domestic Subscribers:

Aiken County Sheriff's Office (South Carolina)

Albany University, Division for Research (New York)

Argyle Police Department (Texas)

Boyd Police Department (Minnesota)

California Department of Justice, South Coast Laboratories (Watsonville)

Chandler Police Department Crime Laboratory (Arizona)

Drug Help (Vernon Hills, Illinois)

Evansville Police Department, Narcotics Unit (Indiana)

Huntington Beach Police Department Crime Laboratory (California)

Indianapolis/Marion County Forensic Science Agency (Indiana)

Kansas Bureau of Investigation, Great Bend Laboratory

Kentucky State Police, Southeastern Regional Laboratory (London)

Maine State Police Crime Laboratory (Augusta)

Memphis Police Department, Vice/Narcotics Unit (Tennessee)

Mobile Police Department, Narcotics Unit (Alabama)

National Forensic Science Technology Center (Largo, Florida)

Naval Criminal Investigative Service Headquarters (Washington, DC)

New Jersey State Police, Central Laboratory (West Trenton)

New Mexico Department of Health, Scientific Laboratory Division (Albuquerque)

New Mexico Department of Public Safety, Sante Fe Laboratory

North Central Texas Narcotics Task Force (Denton)

Northwest Toxicology, Inc. (Salt Lake City, Utah)

Oregon State Police, Bend Forensic Laboratory

Santa Barbara County Sheriff (California)

Springfield Regional Crime Laboratory (Ohio)

Texas Department of Public Safety (Austin)

Union County Prosecutor's Office Crime Laboratory (Westfield, New Jersey)

University of Arkansas, Criminal Justice Institute (Little Rock)

University of Mississippi, Forensic Chemistry Department

U.S. Air Force, 18th Security Force Squadron, Office of Investigations

U.S. Air Force, AFIERA/SDT - Drug Testing Laboratory (Brooks City Base)

U.S. Bureau of Alcohol, Tobacco, and Firearms, Atlanta Laboratory

U.S. Bureau of Alcohol, Tobacco, and Firearms, Guam Field Office

U.S. Coast Guard, Office of Law Enforcement (Washington, DC)

U.S. Food and Drug Administration, Pacific Regional Laboratory (Los Angeles, California)

U.S. Food and Drug Administration, Philadelphia District Laboratory

West Chester University, Department of Chemistry, Forensic Science Program (Pennsylvania)

Non-Domestic Subscribers:

Australian Crime Commission (Canberra)

Australian Federal Police, Computer Forensics Program (Location Unknown)

Maxxam Analytics (Canada)

New South Wales Police Service, Forensic Services (Australia)

Osaka Prefectural Police Headquarters (Japan)

Servizio Polizia Scientifica (Rome)

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**THE DEA FY - 2006 STATE AND LOCAL  
FORENSIC CHEMISTS SEMINAR SCHEDULE**

The remaining FY - 2006 schedule for the DEA's State and Local Forensic Chemists Seminar is as follows:

February 6 - 10, 2006

May 8 - 12, 2006

July 10 - 14, 2006

September 11 - 15, 2006

Note that the school is open only to forensic chemists working for law enforcement agencies, and is intended for chemists who have completed their agency's internal training program and have also been working on the bench for at least one year. There is no tuition charge for this course. The course is held at the AmeriSuites Hotel in Sterling, Virginia (near the Washington/Dulles International Airport). A copy of the application form is reproduced on the last page of the August 2004 issue of *Microgram Bulletin*. Completed applications should be mailed to the Special Testing and Research Laboratory (Attention: Pam Smith or Jennifer Kerlavage) at: 22624 Dulles Summit Court, Dulles, VA 20166. For additional information, call 703/668-3337.

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One of the most important infrastructure development tasks of all forensic laboratory management personnel is the selection of new forensic scientists. Digital evidence laboratories have some unique candidate assessment issues because the applicants' educational backgrounds and work experiences can significantly vary. DEA has either directly or indirectly (outsourced through a computer support contractor) hired a number of computer examiners to keep up with the growing demand for digital evidence support. Here is a list of leading interview questions that have been used by DEA to identify qualified candidates:

1. *"Tell me about your college computer technology coursework."*

Evaluation of a college degree in "computer technology" can be difficult. There are many relevant degrees, including computer science, information science, computer technology, information systems, information assurance, electrical engineering, computer engineering, and more. It is recommended that the actual course curriculum be discussed. In general, the broader and more technical the courses are, the better prepared the candidate will be to confront both digital evidence hardware and software problems. At a minimum, the candidate should have had coursework involving databases, telecommunications, networking, operating systems, and at least one mainstream programming language.

2. *"Tell me about any law enforcement or forensic course related studies you have taken."*

A comprehensive assessment of a college degree (either at the Bachelor or Master's level) should include a review of related majors that may be complementary to computer technology coursework or prior work experience. In particular, a major (or minor) in law enforcement studies or forensic science is desirable. Specific topics of relevance can be, e.g.: Search and seizure law, rules of evidence, expert witness testimony (moot court), or basic forensic science principles (scientific method, Daubert, etc.).

3. *"What technical certifications have you achieved during the past three years?"*

There are a large number and variety of technical certifications that information technology professionals can earn. Digital evidence software vendors may also provide certification(s) in the use of their product(s). Certifications in themselves are an indicator of professionalism. It is best to inquire during the interview how many of the candidate's certifications were granted (or renewed) during the past three years. It is also good to ask what level of effort it took to qualify for certification. Outdated certifications mean very little in the fast world of digital technology.

4. *"Tell me about your recent IT work experiences. What has been the most complex problem that you have solved over the past year?"*

Evaluation of prior IT work experience is always a complex task. Many IT jobs (such as system administration, computer help desk support, and computer staging) are highly structured and narrowly focused. Similarly, programming jobs may be highly detailed but lack broad exposure

to computer hardware. Each individual's prior work experience should be critically considered to determine if the candidate can successfully handle non-routine software and hardware issues.

5. *“What experience do you have working as a Team member or Team Leader?”*

Can the candidate effectively work in a group environment? It is the nature of the IT field that many of its practitioners are somewhat introverted, and it is important that each individual understand that they are part of a team that provides forensic support both in the laboratory and possibly on-site in field settings. How well an individual will function as a team member or team leader can be determined by asking if they have ever worked in a small group environment. Have the candidate discuss what was accomplished by this group. What were the group's strengths and weaknesses? Lastly, what was the candidate's role in the group?

6. *“Why are you interested in working at this laboratory?”*

Often, the most motivated employees are the best employees. Hiring interviews should include questions regarding motivation for seeking employment at the laboratory. A candidate should be able to articulate a well organized statement on why he/she wants the position. Displaying some knowledge regarding your organization's mission (or at least the broader discipline of digital evidence) should be viewed in a positive light.

7. *“What kind of digital evidence examinations are you familiar with? How many cases did you complete (as the principal examiner) in the last three years? How many exhibits did you examine in that period? Have you ever testified as an “expert witness” in a digital evidence matter?”*

Candidates that claim to have prior subject matter training and work experience should be asked to provide a summary of both, along with a list of their recent accomplishments. There is no substitute for recent substantive digital evidence examination work experience. This information is also useful in determining if the candidate's prior work experience involved criminal or civil law enforcement, or administrative or corporate security. Some work backgrounds may be more suitable than others because of the emphasis on chain of custody, and potential public scrutiny of the work product.

8. *Please define the following digital evidence examination terms: “Digital evidence”, “computer forensics”, “image file”, “meta data”, “partition slack”, “logical level data”, “erased file”, “unallocated cluster”, “steganography”, “encryption”, “privileged information”, “Daubert”, “Rule 6(e)”, and “discovery”.*

The interview should also attempt to document the breadth of knowledge of a current or recent digital evidence examiner practitioner. Asking for short definitions on a number of topics often can identify candidates that are the best trained or most experienced.

Successful recruitment of qualified and motivated candidates is essential to the long term success of all forensic programs. Asking the right questions, and soliciting enough details to make an informed hiring decision, are critical in identifying the most qualified candidates. Evaluation of applicant for a digital evidence examiner position is challenging since there is no single college degree major or certification that uniquely qualifies an individual. This situation can only be addressed by skilled interviewing.

Questions or comments? E-mail: [Michael.J.Phelan-usdoj.gov](mailto:Michael.J.Phelan-usdoj.gov)

# Microgram

## Bulletin

Published by:

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Office of Forensic Sciences  
Washington, DC 20537

The U.S. Attorney General has determined that the publication of this periodical is necessary in the transaction of the public business required by the Department of Justice. Information, instructions, and disclaimers are published in the January issues.

VOL. XXXVIII, NO. 12

DECEMBER 2005

### - INTELLIGENCE ALERT -

#### “NIRVANA” CHOCOLATE BAR MIMICS (CONTAINING PSILOCIN) IN THE COLONY, TEXAS

The Texas Department of Public Safety Crime Laboratory (Garland, Texas) recently received 22½ “Nirvana” brand chocolate bar mimics suspected to contain psilocybin mushrooms (see Photos 1 and 2). The bars were seized from a local residence by the The Colony Police Department (The Colony is located north of the Dallas/Ft. Worth metropolitan area). The exhibits appeared to be commercially packaged, with the chocolate bars wrapped in either gold foil or gold foil paper, and overwrapped with professionally appearing printed labels that



Photo 1



Photo 2

included standard nutritional information and bar-coding. However, the labels did not match actual “Nirvana” brand confections (see: [www.NirvanaChocolates.com](http://www.NirvanaChocolates.com)), and the labeling also included comments that the bars contained “a touch of magic”. Upon visual inspection, the chocolate clearly contained plant material (see Photo 3). Analysis of the exhibits (total net mass 1,450 grams) by TLC and GC/MS confirmed psilocin (not quantitated). This was the fourth and largest ever submission of psilocybin mushroom chocolate concoctions to the Garland Laboratory, and the first to be packaged as mimics of a commercial product.



**Photo 3**

\* \* \* \* \*

### **- INTELLIGENCE ALERT -**

### **HEROIN IN FABRIC TUBES WITHIN BASEBALL CAPS IN NEW JERSEY**

The DEA Northeast Laboratory (New York, New York) recently received 12 baseball cap type hats with various logos, each with two long, flat, fabric tubes sewn around their inside perimeters that contained a beige powder, suspected heroin (see Photos 4 and 5). The hats were seized in northern New Jersey by local Task Force Officers, and were submitted through the DEA Newark Field Division (exact locale and circumstances not available). Analysis of the powder (total net mass 40.8 grams) by microscopy, FTIR, GC/FID, and GC/MS confirmed 91 percent heroin hydrochloride. The Northeast Laboratory commonly receives various articles of clothing containing heroin, but this was the first encounter with this particular smuggling technique. The original source (country of origin) of the hats was not reported.



**Photo 4**

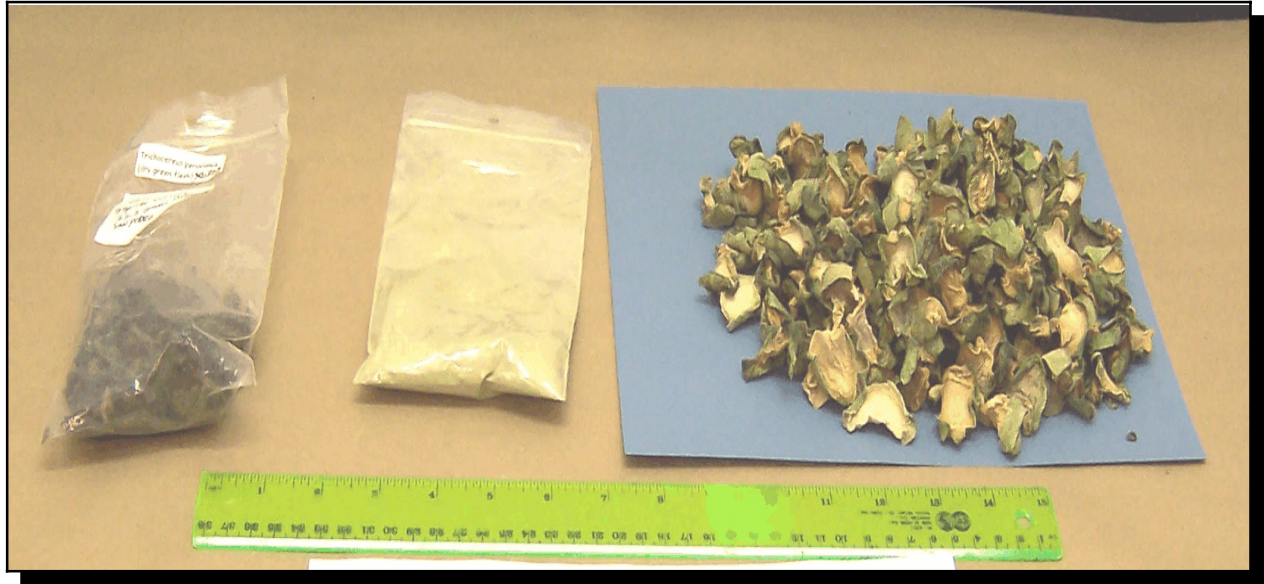


**Photo 5**



**- INTELLIGENCE ALERT -**

**PRESUMED *TRICHOCEREUS PERUVIANUS* CACTUS (CONTAINING MESCALINE)  
IN SAN DIEGO COUNTY, CALIFORNIA**



**Photo 6**

The DEA Southwest Laboratory (Vista, California) recently received a tall jar containing three different exhibits of unknown plant materials, suspected to contain controlled substances (see Photo 6). The first exhibit consisted of black dried plant material (total net mass 33.8 grams) in a plastic bag that was labelled as “*Trichocereus Peruvianus*, dry green flesh” (*Trichocereus peruvianus* is described on the Internet as a mescaline-containing cactus). The second exhibit consisted of loose, large green chunks of dried plant material (total net mass 160.9 grams) in a glass jar, and the third consisted of a yellowish powder (total net mass 27.1 grams) in a plastic bag. The exhibits were seized in conjunction with an indoor marijuana grow in San Diego County. A 3 gram sample of each exhibit was submitted to standard acid/base workup; analyses of the resulting extracts by GC and GC/MS confirmed mescaline in the green chunks and in the yellowish powder, and identified trace mesacaline in the black dried material labelled as “dry green flesh” (quantitations not performed). The actual identities of the plant materials were not confirmed. These are the first submissions of this type to the Southwest Laboratory.

\* \* \* \* \*

**- INTELLIGENCE ALERT -**

**MIXED COCAINE AND COCAINE MIMIC PACKAGES IN LAREDO, TEXAS**

The DEA South Central Laboratory (Dallas, Texas) recently received 11 samples of white powder, suspected cocaine. The samples were selected from a total of 48 brick-sized bundles, that had been seized by Customs and Border Protection personnel in Laredo, Texas from the

rear tires of a vehicle crossing the border from Mexico. The bundles were wrapped in carbon paper, grease, and cellophane, and came in two distinct sizes (see Photo 7), with the smaller packages being about half the thickness of the larger packages, but all weighing about 1 kilogram each. Preliminary screening indicated that only the larger bundles contained cocaine, and so the entire seizure was submitted for analysis. Analysis of the material in 32 larger bundles (total net mass 32.13 kilograms) by IR/ATR, GC/FID, and GC/MS confirmed 81 percent cocaine hydrochloride. Analysis of the material in 15 smaller bundles (total net mass 15.37 kilograms) by IR/ATR and GC/MS indicated no controlled substance (the material was tentatively identified as calcium sulfate). [The results of analysis for the 48th bundle was not reported.] While large seizures of cocaine HCl bricks are not uncommon, this submission was unusual in that it contained cocaine brick mimics.



**Photo 7**

\* \* \* \* \*

### **- INTELLIGENCE ALERT -**

### **RECTANGULAR HEROIN PELLETS IN MIAMI, FLORIDA**

The DEA Southeast Laboratory (Miami, Florida) recently received 140 unusual rectangular, plastic and latex-wrapped pellets containing a compressed, off white powder, suspected heroin (see Photo 8). The exhibits were seized by U.S. Customs and Border Patrol personnel from within a wooden crate that had arrived from Medellin, Colombia. Analysis of the powder (total net mass 2,990 grams) by GC/MS and FTIR confirmed 93 percent heroin hydrochloride. This is believed to be the first submission of rectangular pellets to the Southeast Laboratory. Because the pellets had been removed from the crate before submission to the laboratory, it is unknown whether the pellets were rectangular as a result of being forced into an enclosed space, or were prepared in that shape for some other reason.



**Photo 8**



**- INTELLIGENCE BRIEF -**

***SALVIA DIVINORUM* IN MORAGA, CALIFORNIA**

The Contra Costa County Sheriff's Crime Laboratory (Martinez, California) recently received one bag of seeds and two bags of green plant material, the latter both submitted as suspected marijuana (however, one of the bags was labeled "*Salvia Divinorum* 10x") (photos not available). The exhibits were seized in Moraga (Contra Costa County) by the Moraga Police Department, pursuant to a burglary investigation. It was determined that the plant material in the bag labeled as "*Salvia Divinorum* 10x" (total net mass less than three grams) was not marijuana. Analysis of a methanolic extract of a sample of the material by GC/MS gave no data; however, analysis of a boiling chloroform extract by GC/MS presumptively identified Salvinorin A, the primary hallucinogen in *Salvia divinorum* (not quantitated). The second bag in this case was not labelled and was found to contain no controlled substances. The seeds in the third bag were not identified. This was the first submission of *Salvia divinorum* to the laboratory.

\* \* \* \* \*

**- INTELLIGENCE BRIEF -**

**COCAINE CONTAINING DILTIAZEM IN DEER PARK, TEXAS**

The Pasadena Police Department Regional Crime Laboratory (Pasadena, Texas) recently received two samples of cocaine hydrochloride from the Deer Park (Texas) Police Department that contained diltiazem (Pasadena and Deer Park are located just east of Houston). The samples were analyzed using GC/MS and FTIR analysis, and diltiazem was confirmed via comparison with a pharmaceutical standard.

[Editor's Note: For comprehensive analytical data for diltiazem, see: Peters DE. Diltiazem HCl: An analytical profile. *Microgram Journal* 2004;2(1-4):11.]

\* \* \* \* \*      \* \* \* \* \*      \* \* \* \* \*      \* \* \* \* \*      \* \* \* \* \*

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[Selected references are a compilation of recent publications of presumed interest to forensic chemists. Unless otherwise stated, all listed citations are published in English. Listed mailing address information (which is sometimes cryptic or incomplete) exactly duplicates that provided by the abstracting services. Patents are reported only by their *Chemical Abstracts* citation number.]

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in 123 products acquired in Japan. Contact: Natl. Inst. Hlth. Sci., Setagaya Ku, 1-18-1 Kamiyoga, Tokyo 1588501, Japan.]

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\* \* \* \* \*

## **THE DEA FY - 2006 STATE AND LOCAL FORENSIC CHEMISTS SEMINAR SCHEDULE**

The remaining FY - 2006 schedule for the DEA's State and Local Forensic Chemists Seminar is as follows:

February 6 - 10, 2006  
May 8 - 12, 2006  
July 10 - 14, 2006  
September 11 - 15, 2006

Note that the school is open only to forensic chemists working for law enforcement agencies, and is intended for chemists who have completed their agency's internal training program and have also been working on the bench for at least one year. There is no tuition charge for this course. The course is held at the AmeriSuites Hotel in Sterling, Virginia (near the Washington/Dulles International Airport). A copy of the application form is reproduced on the last page of the August 2004 issue of *Microgram Bulletin*. Completed applications should be mailed to the Special Testing and Research Laboratory (Attention: Pam Smith or Jennifer Kerlavage) at: 22624 Dulles Summit Court, Dulles, VA 20166. For additional information, call 703/668-3337.

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# Computer Corner

Computer Forensic Examination Workstations

# #201

by Steve Carter, Group Supervisor  
DEA Digital Evidence Laboratory

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[Editor's Preface: This issue of "Computer Corner" marks the start of the third era of columnists. "Computer Corner" was initiated by Senior Forensic Chemist Chuck Harper at DEA's Special Testing and Research Laboratory. Chuck wrote the first 120 issues, focusing on basic aspects of computer operations - that is, the "nuts and bolts" of how computers work. In April of 1999, "Computer Corner" was picked up by Group Supervisor (later Laboratory Director) Mike Phelan, who changed the focus to (first) Computer Forensics and then to the broader field of Digital Evidence. Last month's issue was Mike's last - but not the end of "Computer Corner" or its current focus on Digital Evidence. "Computer Corner" will now be written by the staff at DEA's Digital Evidence Laboratory.

\* \* \* \* \*

An examination workstation should contain the necessary items that will allow an examiner to perform a complete computer forensic examination. DEA provides workstations containing a comprehensive array of components (detailed below) to each computer forensic examiner. The current, estimated costs for these components are also detailed below.

## Setup:

- Hard drive duplicator (to duplicate an exhibit's hard drive)
- Uninterruptible power supplies (to maintain power to the workstation if there is a power outage)
- Storage cabinet (to store media, tools, etc.)
- Monitors (to view what's coming from the forensic computer)
- SCSI/Promise card (to attach additional hard drives to a computer)
- Work copy hard drives (to contain the "images" of an exhibit)
- Tool kit (to open an exhibit in order to retrieve the hard drive)
- Laser printer (to make printouts of findings, etc.)
- Evidence security box (to store working copies, case files, or other small items that are case related)
- Evidence cart (to transport evidence from the evidence vault to the forensic workstation and back)
- Set of registered forensic software (to analyze exhibits)
- Set of miscellaneous cables, connectors (needed for extra connectivity)
- Sets of electrical power cords and surge protectors, power strips (to provide power or protection to the workstation)
- Office telephone (to communicate with the case agent, attorney(s), and others)
- Write blockers (to protect against changes being made to the original evidence)
- Forensic laptop for on-site acquisitions (to perform on-site backups)
- Workbenches (to hold the forensic workstation)
- Intranet terminal (to communicate with the case agent and others)



Costs:

	<u>Item</u>	<u>Unit Cost</u>	<u>Number of Units</u>	<u>Total Cost</u>
•	Hard drive duplicator	\$3,000	3	\$9,000
•	Uninterruptible power supply	\$600	3	\$1800
•	Storage cabinet	\$800	1	\$800
•	Monitors	\$600	2	\$1,200
•	SCSI/Promise Card	\$300	5	\$1,500
•	Work copy hard drives	\$300	20	\$6,000
•	Tool kit	\$300	1	\$300
•	Laser printer	\$700	1	\$700
•	Evidence Security box	\$500	1	\$500
•	Evidence cart	\$250	1	\$250
•	Registered software	\$4,000	1	\$4,000
•	Misc. cables, connectors	\$300	1	\$300
•	Power cords surge protector	\$150	3	\$450
•	Office phone	\$325	1	\$325
•	Write blockers	\$1,300	2	\$2,600
•	Forensic laptop	\$2,500	1	\$2,500
•	Workbench	\$3,000	2	\$6,000
•	Intranet Terminal	\$5,000	1	\$5,000

Includes:

- Software licenses
- Network cable drop
- Shared printer

Collective Total (per examiner): \$38,225

Questions or comments? E-mail: [Steven.L.Carter -at- usdoj.gov](mailto:Steven.L.Carter-usdoj.gov)

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# Microgram

## *Bulletin*

**Published by:**

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Washington, DC 20537

The U.S. Attorney General has determined that the publication of this periodical is necessary in the transaction of the public business required by the Department of Justice. Information, instructions, and disclaimers are published in the January issues.

- JANUARY 2007 -

### SUBSCRIBER EVALUATION SURVEY COMING

This issue marks the start of *Microgram*'s 40th year of publication. The last survey of *Microgram* subscribers was approximately eight years ago. Since that survey, *Microgram* has undergone many changes, including conversion from law enforcement sensitive to unclassified, from hard copy mailings to Internet postings on the DEA website with email notifications, from black and white to color, from the technical "nuts and bolts" aspects of how computers operate to Computer Forensics/Digital Evidence, and the splitting into *Microgram Bulletin* and *Microgram Journal*. In addition, the readership has expanded from about 400 organizations (the majority of which were forensic and crime laboratories) to over 1,400 organizations (the majority of which are front-line law enforcement agencies). In CY 2006, the external *Microgram* website had approximately 1.4 million "hits" (pageviews).

In an effort to further improve the value of *Microgram* to the readership, a survey will be emailed to the subscribers within the next week. This survey will ask subscribers to evaluate *Microgram*, offer constructive criticism, and make suggestions for improvements.

In order to limit the responses to a reasonable number, and to avoid repetitive comments from the same agency, it is requested that only the primary Point-of-Contact (POC) for each agency respond to the survey (that is, the individual who receives the emailed notices). However, all readers from the subscriber agencies are invited to provide input to their respective POCs. Note that the survey will not be posted on the *Microgram* website.



**- INTELLIGENCE ALERT -**

**METHAMPHETAMINE SUPER-LAB USING TARTARIC ACID  
RESOLUTION IN GUADALAJARA, MEXICO**

The DEA Special Testing and Research Laboratory (Dulles, Virginia) recently received 11 exhibits acquired at a clandestine methamphetamine laboratory in Guadalajara, Mexico. The laboratory purportedly contained 500 kilograms of finished methamphetamine products when seized (no photos). Based on the items and chemicals recovered at the site, phenylacetic acid was being converted to phenyl-2-propanone (phenylacetone), which was then being converted to methamphetamine via a reductive amination route. Of the 11 exhibits, one contained 99 percent phenylacetic acid, three contained methamphetamine hydrochloride (average purity 99 percent), and quite unusually, five contained high purity methamphetamine tartrate (average purity 90 percent); the remaining two exhibits were water.

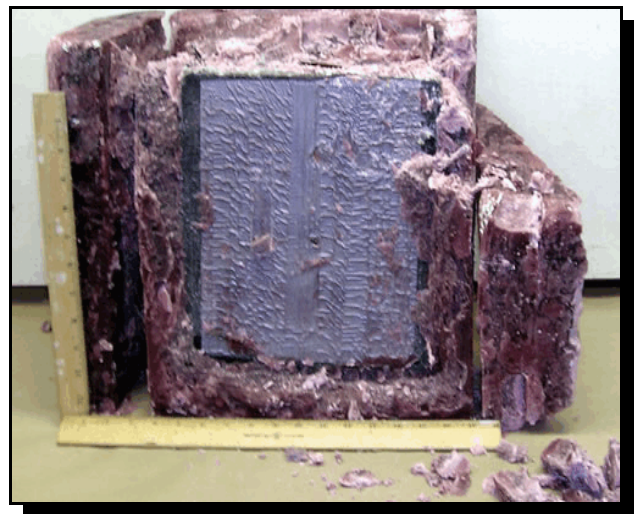
Tartaric acid is commonly utilized to resolve racemic mixtures of amine bases, but resolution of illicitly prepared drugs is unusual, especially on such a large scale. Enantiomeric analyses indicated that the methamphetamine hydrochloride samples averaged 77 percent *dextro* and 23 percent *levo*, while the methamphetamine tartrate samples averaged 91 percent *levo* and 9 percent *dextro*. These are the first submissions of these types to the Special Testing and Research Laboratory.

\* \* \* \* \*

**- INTELLIGENCE ALERT -**

**COCAINE IN A VERY LARGE BLOCK OF WAX IN NEW YORK**

The DEA Northeast Laboratory (New York, New York) recently received a large block of dark colored wax (26.9 kilograms) that contained a brick of white powder, suspected cocaine (see Photo 1). The exhibit was seized in New York City by agents from the New York Strike Force (details sensitive). Analysis of the powder (total net mass 2.0 kilograms) by GC/FID, CE, GC/MS, and FTIR/ATR confirmed 82 percent cocaine hydrochloride, adulterated with levamisole. The Northeast Laboratory has encountered a variety of concealment techniques, including cocaine in wax candles\*, but this is the first submission of cocaine smuggled in such a large block of wax.



**Photo 1 (Note: The Bottom Ruler is 18 Inch;  
The Left-Hand Ruler is 12 Inch)**

[\* Editor's Note: For two examples of large wax candles containing cocaine, see: Microgram Bulletin 2003;36(9):202, and: Microgram Bulletin 2004;37(1):2.]

**- INTELLIGENCE ALERT -**

**COCAINE SMUGGLED IN ELECTRIC GUITARS (FROM MEXICO)  
AT THE BALTIMORE/WASHINGTON INTERNATIONAL (BWI) AIRPORT**



**Photo 2**

The DEA Mid-Atlantic Laboratory (Largo, Maryland) recently received two electric guitars with compressed white powders concealed in hollowed-out sections in their bases, suspected cocaine (see Photos 2 and 3). The exhibits originated in Mexico, and were seized at the Baltimore/Washington International Airport by Immigration and Customs Enforcement personnel (no further details). Both guitars appeared to be fully operational (not checked), and neither had obvious seams or any external indications of tampering (that is, the paint and an inner, hard plastic layer were apparently added after the drugs were concealed). Analysis of the powder (total net mass 2,878 grams) with GC, GC/MS, and FTIR confirmed 83 percent cocaine hydrochloride adulterated with diltiazem. This is the first known submission of this concealment method to the Mid-Atlantic Laboratory.

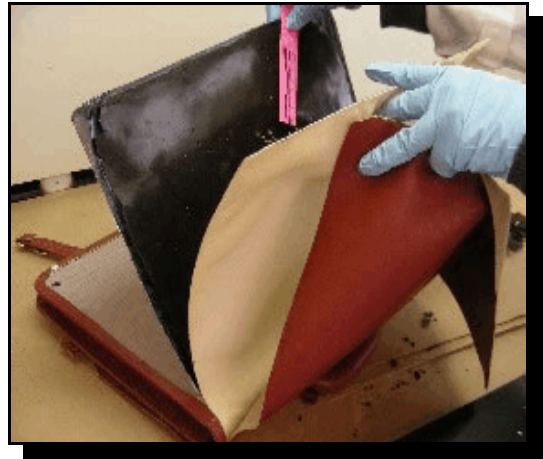


**Photo 3**

**- INTELLIGENCE ALERT -**

**OPIUM SMUGGLED IN ATTACHE CASES IN LOUISVILLE, KENTUCKY**

The DEA North Central Laboratory (Chicago, Illinois) recently received 16 red leather attaché cases and 5 black vinyl attaché cases; the red cases had plastic pouches sewn into the seams of their front and back panels, each of which contained a gummy black substance that had the characteristic odor of opium (see Photo 4). The exhibits were in transit from Turkey to Canada, and were seized by U.S. Customs Service personnel at a parcel delivery service's sorting and processing facility in Louisville, Kentucky. The cases were professionally assembled, showed no external signs of tampering, and (until disassembled) did not smell of opium. The pouches were flat and the same size as the attaché, each consisted of a layer of thin cardboard, two



**Photo 4**

pieces of stiff plastic, and a layer of carbon paper, and contained approximately 254 grams of the suspected opium. Analysis of the substance (total net mass 8.185 kilograms in 32 pouches) by GC/FID and GC/MS identified meconin, hydrocotarine, codeine, morphine, thebaine, papaverine, noscapine and acetaminophen, confirming opium. The black attaché cases were constructed with a layer of vinyl over a piece of thin cardboard, but did not contain any secreted materials. The North Central Laboratory receives these type submissions several times a year.

\* \* \* \* \*

**- INTELLIGENCE ALERT -**

**DRIED OPIUM POPPY PODS IN FRESNO, CALIFORNIA**

The DEA Western Laboratory (San Francisco, California) recently received 47 dried plant pods on short stalks, suspected opium poppy pods (see Photo 5). The exhibits were shipped from New York via a commercial carrier, and were seized in Fresno, California by personnel from the U.S. Department of Agriculture (no further details). The pods (total net mass 553.6 grams) averaged 5 centimeters tall by 2.5 - 3.5 centimeters in diameter, and each contained a mass of small black seeds. Following standard acid/base workup, analysis of methylene chloride extracts by GC/MS confirmed morphine and codeine (not quantitated), and also indicated thebaine, noscapine, and papaverine, confirming opium poppy pods. This is one of the largest exhibits of poppy pods ever submitted to the Western Laboratory.



**Photo 5**

\* \* \* \* \*



**- INTELLIGENCE BRIEF -**

**- QUAALUDE LEMMON 714 MIMIC TABLETS (CONTAINING DIAZEPAM) -**

**- SURPRISING PERSISTENCE -**

The recent reports of Quaalude mimic tablets (containing diazepam) in Lexington Park, Maryland (*Microgram Bulletin* 2006;39(8):99; see Photo 6) and on the U.S./Canadian border near Oroville, Washington (*Microgram Bulletin* 2006;39(9):115; no photo) mark the latest two submissions in a now 25 year history of such tablets. Manufacture of authentic (pharmaceutical) Quaalude Lemmon 714 tablets (containing methaqualone) was discontinued by



**Photo 6**

Lemmon Pharmaceuticals on November 15th, 1983; however, Quaalude counterfeit, mimic, and fake tablets had been in common circulation since the mid-1970s. [“Counterfeits” contained methaqualone, “mimics” contained one or more of a variety of controlled substances (not including methaqualone), and “fakes” contained no controlled substances.] The licit and illicit Quaaludes submitted to forensic laboratories between about 1975 and 1980 were primarily Rorer 714s, but the William H. Rorer Company sold the Quaalude rights to Lemmon Pharmaceuticals in 1979, and by mid-1980 most Quaaludes (both licit and illicit) were Lemmon 714s.

Amazingly, illicit Lemmon 714s were being seized on the streets before the licit product was available at pharmacies. This reflected the enormous extent of Quaalude abuse, which rivaled marijuana abuse in 1980 and 1981, and in fact the Lemmon 714 tablet is by far the most illicitly replicated pharmaceutical product in the history of the Drug Enforcement Administration, with at one time over 250 different exemplars in the Reference Collection at the DEA Special Testing and Research Laboratory.

Extensive efforts by the DEA Office of Diversion Control in the late 1970s and early 1980s led to increasingly restrictive international controls on methaqualone and its precursors, and methaqualone was transferred to Schedule I of the U.S. Controlled Substances Act in 1984. As stocks of methaqualone dried up worldwide, clandestine manufacturers quickly settled on diazepam as the controlled substance of choice for Lemmon 714 mimics, and virtually all such tablets submitted to forensic laboratories since 1990 were determined to contain only diazepam. Initial variability in tablet compositions was a serious concern - some of the early mimics contained as much as 300 milligrams of diazepam, and overdoses and deaths from combining these Quaaludes mimics and alcohol were a major problem in some areas (quite notably in Atlanta, Georgia).

Currently, it is believed that Lemmon 714 mimics are still being sporadically produced, probably outside the United States. However, it is also thought that many of the Lemmon 714 mimics being seized by law enforcement authorities may actually be from 20 - 25 year old stashes (that is, recovered by previously incarcerated Quaalude traffickers upon their releases from prison). Oddly, despite ample published information to the contrary, most of the “testimonials”

concerning Quaaludes (that is, Lemmon 714 tablets) on the various drug-abuse websites make it clear that the users still believe that they are ingesting genuine Quaaludes (which is quite unlikely). The last report in *Microgram* of authentic or counterfeit Quaaludes was in 1981, and the last submissions of such tablets to the DEA Special Testing and Research Laboratory were in 1985. Diazepam is currently classified as Schedule IV.

The following list are all the citations in *Microgram* or *Microgram Bulletin* of Quaalude Lemmon 714 mimic tablets containing diazepam or (less commonly) a mixture of diazepam and another controlled substance.\* Not included are approximately another dozen citations of “Quaaludes containing diazepam” that did not contain logo information or photos.

1980;13(2):16 - Philadelphia Police Department Crime Laboratory  
1980;13(4):50 - New Jersey State Police North Regional Laboratory (Little Falls)  
1980;13(6):102 - DEA Southeast Laboratory (Miami)  
1980;13(7):113 - DEA South Central Laboratory (Dallas)  
1980;13(6):124 - DEA Southeast Laboratory (Miami)  
1980;13(6):161 - Southeast Missouri Regional Crime Laboratory (Cape Girardeau)

1981;14(2):10 - Philadelphia Police Department Crime Laboratory  
1981;14(4):37 - Regional Forensic Laboratory (Painesville, Ohio)  
1981;14(5):54 - Philadelphia Police Department Crime Laboratory

1982;15(10):165 - Metro-Dade Police Department Crime Laboratory (Miami)

1984;17(12):176 - DEA Northeast Laboratory (New York)

1991;24(10):244 - Southeast Missouri Regional Crime Laboratory (Cape Girardeau)  
1991;24(12):283 - Aurora Police Department Crime Laboratory (Colorado)

1992;25(3):42 - San Bernardino County Sheriff's Forensic Science Laboratory (California)

1993;26(10):221 - Northern Illinois Police Crime Laboratory (Highland Park)

1995;28(8):235 - Mansfield Police Department Laboratory (Ohio)

1996;29(8):199 - University of Massachusetts Drugs of Abuse Laboratory

1997;30(2):26 - Regional Crime Laboratory at the Indian River Community College (Florida)  
1997;30(6):115 - Tennessee Bureau of Investigation Crime Laboratory (Nashville)

2006;39(8):99 - Maryland State Police-Forensic Sciences Division (Pikesville)  
2006;39(9):115 - DEA Western Laboratory (San Francisco)

\* Notes: All issues of *Microgram* and *Microgram Bulletin* published prior to January 2003 are Law Enforcement Restricted. Dr. Edward Franzosa, Ph.D., of the DEA Special Testing and Research Laboratory (Dulles, Virginia) contributed to this Intelligence Brief.

## SELECTED REFERENCES

[Selected references are a compilation of recent publications of presumed interest to forensic chemists. Unless otherwise stated, all listed citations are published in English. Abbreviated contact information duplicates that provided by the abstracting service. Patents and Proceedings are reported only by their *Chemical Abstracts* citation number.]

1. Apollonio LG, Pianca DJ, Whittall IR, Kyd JM, Maher WA. **A comparison of atmospheric pressure chemical ionization and electrospray ionization in testing of amphetamine-type substances and ketamine using ultra-performance liquid chromatography/mass spectrometry.** *Rapid Communications in Mass Spectrometry* 2006;20(18):2777. [Editor's Notes: The title technique was used to analyze a reference mixture of amphetamine, methamphetamine, MDA, MDMA, and ketamine. Contact: National Centre for Forensic Studies, University of Canberra, Bruce ACT 2601, Australia.]
2. Burnett A, Fan W, Upadhy P, Cunninham J, Edwards H, Munshi T, Hargreaves M, Linfield E, Davies G. **Complementary spectroscopic studies of materials of security interest.** (Proceedings) *Chemical Abstracts* 2006:1148742.
3. Causin V, Marega C, Carresi P, Schiavone S, Marigo A. **A quantitative differentiation method for plastic bags by infrared spectroscopy, thickness measurement, and differential scanning calorimetry for tracing the source of illegal drugs.** *Forensic Science International* 2006;164(2-3):148. [Editor's Notes: 50 bags of types typically used for drug packaging were analyzed. The results indicate that even mass-produced bags have a large degree of variability, and can be differentiated and/or linked. Contact: Dipartimento di Scienze Chimiche dell'Universita, via Marzolo 1, Padua 35131, Italy.]
4. Cox M, Klass G. **Synthesis by-products from the Wacker oxidation of safrole in methanol using p-benzoquinone and palladium chloride.** *Forensic Science International* 2006;164(2-3):138. [Editor's Notes: Presents the title study, including analyses of samples from a clandestine laboratory seized in Australia that was employing this synthesis route. Contact: Forensic Science, 21 Divett Place, Adelaide 5000 SA, Australia.]
5. Freudenmann RW, Oxler F, Bernschneider-Reif S. **The origin of MDMA (Ecstasy) revisited: The true story reconstructed from the original documents.** *Addiction* 2006;101:1241. [Editor's Notes: Debunks the common (almost universal) belief that MDMA was developed by Merck as an appetite suppressant. Contact: Department of Psychiatry, University of Ulm, Leimgrubenweg 12, 89075 Ulm, Germany.]
6. Kraj A, Swist M, Strugala A, Parczewski A, Silberring J. **Fingerprinting of 3,4-methylenedioxymethamphetamine markers by desorption/ionization on porous silicon.** *European Journal of Mass Spectrometry* 2006;12:253. [Editor's Notes: Presents the title study on MDMA synthesized by four different routes. Analyses were done using MALDI-ToF mass spectrometry. Contact: Department of Neurobiochemistry, Faculty of Chemistry and Regional Laboratory, Jagiellonian University, Ingardena 3, 30-060 Krakow, Poland.]
7. Odell LR, Skopec J, McCluskey A. **A cold synthesis of heroin and implications in heroin signature analysis.** *Forensic Science International* 2006;164(2-3):221. [Editor's Notes: Focuses on the impurity profile of heroin produced by this unusual route. Several trifluoroacetyl derivatives were identified, but were also found to be sensitive to typical heroin signature



workup and analysis procedures. Contact: Chemistry Building, School of Environmental and Life Sciences, The University of Newcastle, University Drive, Callaghan NSW 2308, Australia.]

8. Qi Y, Evans ID, McCluskey A. **Australian Federal Police seizures of illicit crystalline methamphetamine (Ice) 1998 - 2002: Impurity analysis.** Forensic Science International 2006;164(2-3):201. [Editor's Notes: 19 samples seized at Australian POE's were analyzed by methamphetamine impurity profiling techniques; over 30 characteristic impurities were identified. Contact: Chemistry Building, School of Environmental and Life Sciences, The University of Newcastle, University Drive, Callaghan NSW 2308, Australia.]
9. Schiff PL. **Ergot and its alkaloids.** American Journal of Pharmaceutical Education 2006;70(5):1. [Editor's Notes: A historical overview and review. Contact: Department of Pharmaceutical Sciences, School of Pharmacy, University of Pittsburgh, Pittsburgh, PA 15261.]
10. Tsujikawa K, Mohri H, Kuwuyama K, Miyaguchi H, Iwata Y, Gohda A, Fukushima S, Inoue H, Kishi T. **Analysis of hallucinogenic constituents in Amanita mushrooms circulated in Japan.** Forensic Science International 2006;164(2-3):172. [Editor's Notes: 7 samples were analyzed. Contact: First Chemistry Section, National Research Institute of Police Science, 6-3-1, Kashiwanoha, Kashiwa, Chiba 277-0882, Japan.]
11. Zhang L, Ma L, Gong H, Li L. **Determination of scopolamine content in compound Huangqi capsules by HPLC.** Zhongcaoyao 2005;36(11):1661. [Editor's Notes: Presents the title analysis. This article is written in Chinese. Contact: Department of Pharmaceutical Chemistry, Medical College of Chinese People's Armed Police Force, Tianjin 300162, Peop. Rep. China.]

#### **Additional References of Possible Interest:**

1. Anwar F, Latif S, Ashraf M. **Analytical characterization of hemp (Cannabis sativa) seed oil from different agro-ecological zones of Pakistan.** Journal of the American Oil Chemists Society 2006;83(4):323. [Editor's Notes: Presents the title study on cold-pressed hemp seed oils from 3 different regions. Contact: Departments of Chemistry and Botany, University of Agriculture, Faisalabad-38040, Pakistan.]
2. Gosav S, Praisler M, Dorohoi DO, Popa G. **Structure-activity correlations for illicit amphetamines using ANN and constitutional descriptors.** Talanta 2006;70(5):922. [Editor's Notes: Compounds not specified in the abstract. "ANN" is an acronym for an artificial neural network; the "constitutional descriptors" were not specified in the abstract. The primary database consisted of GC-FTIR data for a large number of drugs of abuse and related compounds. Contact: Department of Physics, Dunarea de Jos University, Str. Domneasca nr. 47, Galati, Rom.]
3. Jiang H-p, Ren C-h. **Study on DFT of the structure and property of MDMA molecule.** Xihua Daxue Xuebao, Ziran Kexueban 2006;25(5):69 6A. [Editor's Notes: A theoretical study of the structure and properties of MDMA by the "d. functional theory" ("d." was not defined in the abstract). This article is written in Chinese. Contact: Department of Criminal Technology, College of Sichuan Police Officer, Luzhou Sichuan 646000, Peop. Rep. China.]
4. Mitchell-Roberts AC. **Advanced techniques in mass spectrometry for forensic applications.** Dissertation Abstracts International, B 2006;67(1):237. [Editor's Notes: Abstract not provided. Contact: Univ. of Florida, Gainesville, FL (zip code not provided).]

5. Morley SR, Hall CJ, Forrest ARW, Galloway JH. **Levamisole as a contaminant of illicit cocaine.** Journal of the Clandestine Laboratory Investigating Chemists Association 2006;16(4):11. [Editor's Notes: Focus is on detection in body fluids of cocaine abusers (including six who were deceased) acquired over a 20 week period in the United Kingdom. *JCLICA* is a law enforcement restricted journal. Contact: Toxicology Section, Department of Clinical Chemistry, Sheffield Teaching Hospital Foundation Trust, Sheffield, S10 2JF, United Kingdom.]
6. Uchida K, Yokoshima S, Kan T, Fukuyama T. **Total synthesis of (+/-)-morphine.** Organic Letters 2006;8(23):5311. [Editor's Notes: Presents the title synthesis. Contact: Graduate School of Pharmaceutical Sciences, University of Tokyo, 7-3-1 Hongo, Bunkyo-ku, Tokyo 113-0033, Japan.]

\* \* \* \* \*

## THE JOURNAL/TEXTBOOK COLLECTION EXCHANGE

The Journal/Textbook Collection Exchange is a service intended to facilitate the transfer of unwanted journals and textbooks to forensic libraries or other *Microgram* subscribers. At present, this service is offered once a quarter (in January, April, July, and October). There were no donations offered during the past quarter.

**All subscribers are encouraged to donate surplus or unwanted items/collections.** Reference texts and long runs of forensic/analytical journals are of particular interest; however, even single issues are worthwhile. If interested, please consult the *Microgram* website or contact the *Microgram* Editor for further instructions.

The next offering of journals and textbooks will be in the April 2007 issue of *Microgram Bulletin*.

\* \* \* \* \*

## THE DEA FY - 2007 STATE AND LOCAL FORENSIC CHEMISTS SEMINAR SCHEDULE

The remaining FY - 2007 schedule for the DEA's State and Local Forensic Chemists Seminar is as follows:

February 5 - 9, 2007  
May 7 - 11, 2007  
July 9 - 13, 2007  
September 10 - 14, 2007

Note that the school is open only to forensic chemists working for law enforcement agencies, and is intended for chemists who have completed their agency's internal training program and have also been working on the bench for at least one year. There is no tuition charge for this course. The course is held at the AmeriSuites Hotel in Sterling, Virginia (near the Washington/Dulles International Airport). A copy of the application form is reproduced on the last page of the August 2004 issue of *Microgram Bulletin*. Completed applications should be mailed to the Special Testing and Research Laboratory (Attention: J. Kerlavage) at: 22624 Dulles Summit Court, Dulles, VA 20166. For additional information, call 703/668-3337.

## EMPLOYMENT OPPORTUNITY

Position: **Forensic Chemist**

(Second Posting)

Location: Indian River Crime Laboratory; Fort Pierce, Florida

Salary: \$55,000 – \$65,000 depending on experience

Application Deadline: Open until filled

Duties: Responsibilities include the analysis of controlled substances; interpretation of laboratory analyses and results; preparation of written reports; and the ability to testify as an expert witness.

General Requirements: The applicant must be skilled in using gas chromatography, mass spectroscopy, ultraviolet and infrared spectrophotometry, and other drug analysis equipment and methodologies. A familiarity with the technical and safety requirements of ASCLD/LAB, and demonstrated proficiency testing in controlled substance analysis are required. A Master's degree in chemistry or forensic science (with chemistry undergraduate degree) and two years of forensic laboratory experience are preferred. Experience in head-space BAC analysis is desirable. An extensive background investigation is required, and laboratory personnel are subject to random drug testing. EEO.

Application Procedure: Applications may be obtained on-line at [stluciesheriff.com](http://stluciesheriff.com) or by contacting:

Saint Lucie County Sheriff's Office

Human Resources Department

4700 W. Midway Road

Fort Pierce, FL 34981-4825

Phone: (772) 462-3206

Fax: (772) 462-3218

For additional information about the position, contact:

Daniel C. Nippes, Director (or) Babu Thomas, Senior Criminalist

Indian River Crime Laboratory

2502 S. 35th Street

Fort Pierce, FL 34981

[dnippes-at-ircc.edu](mailto:dnippes-at-ircc.edu) (or) [bthomas-at-ircc.edu](mailto:bthomas-at-ircc.edu)

Phone: (772) 462-3600

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## **New *Microgram* Editor Email Address Became Effective January 1st, 2007**

On January 1st, 2007, the *Microgram* Editor's email address changed from [microgram\\_editor -at- mailsnare.net](mailto:microgram_editor-at-mailsnare.net) to: [microgram-2007 -at- mailsnare.net](mailto:microgram-2007-at-mailsnare.net). This change was necessitated by the ever-increasing numbers of spam emails being received at the [microgram\\_editor -at- mailsnare.net](mailto:microgram_editor-at-mailsnare.net) address. An automated response will be maintained on the [microgram\\_editor -at- mailsnare.net](mailto:microgram_editor-at-mailsnare.net) address for the first three months of CY 2007.

Please make a note of this change. Note that similar email address changes can be anticipated on the first of each year, substituting the appropriate year in the address.

## Who is Qualified to Conduct Forensic Examinations of Digital Evidence? - Differing Points of View

by Clay Schilling  
Group Supervisor  
DEA Digital Evidence Laboratory

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An issue that is arising with increasing frequency is who is best qualified to conduct computer forensic examinations? It is becoming routine for criminal investigators, prosecutors, and intelligence analysts to request copies of seized digital evidence with the intent of performing their own examinations. The justifications presented for these requests range from: "Only I can determine what is relevant;" to: "I don't have time to wait, I need the information now;" to: "It's just information - anyone can process it." After discussing the complexities and pitfalls associated with conducting computer forensic examinations, most of the individuals making such requests usually come to understand that such examinations should in fact only be conducted by individuals trained in digital forensics. This two-part article will explore this issue in greater detail.

### The Root of the Problem

Not surprisingly, "digital evidence" appears to be the only forensic discipline that is plagued by this issue. That is, very few of the persons demanding copies of seized digital evidence would ever request the evidence in any other forensic discipline with the intention of conducting their own analyses. This suggests an underlying misconception as to what digital evidence is, and what it takes to properly analyze it in a forensically sound manner. Almost certainly, the fact that virtually everyone is familiar with computers and many other consumer digital or electronic devices (such as cell phones, personal data assistants (PDAs), flash drives, etc.) has them believing that extracting information from such devices is not particularly challenging - especially if they have successfully performed troubleshooting or data recovery on their own or other digital devices. In this field, it is true that a little knowledge can be a dangerous thing.

### Digital Evidence - Storage Media versus Information

Digital evidence is defined as: "Any information of probative value that is stored or transmitted in binary form" (Scientific Working Group on Digital Evidence (SWGDE), SWGDE / SWGIT Digital & Multimedia Evidence Glossary, Version: 2.0 (January 13, 2006)). It is possible that using the term "information" as a synonym for "digital evidence" is a major part of the problem. When "digital evidence" is seized at a crime scene, the investigators are not collecting "information" *per se* - rather, they are collecting physical items, such as computers, cell phones, PDAs, hard disk drives (HDDs), compact disks (CDs), digital video disks (DVDs), floppy disks, flash drives, and/or similar item(s). These physical items (also sometimes identified as "digital storage media") - *and not the information that is recorded on them* - are usually what is identified on evidence custody documents, entered into evidence management systems, and presented in court as to what was seized. However, forensic definitions and courtroom testimonies concerning digital evidence are almost always about the information that was recovered from the media - not about the media itself.

In order to simplify the "apples and oranges" disparities between the information and the media, two models have been developed that equate the "digital storage media" to a "filing cabinet" or to a "crime scene."

## **The Filing Cabinet Model**

The "filing cabinet" model is easy to understand, as it is also a "storage container" that holds a wealth of information that is organized in "hard copy" files and folders - (apparently) equivalent to the "electronic" files and folders found on a hard drive or equivalent "digital storage media." This may explain why many criminal investigators, prosecutors, and intelligence analysts believe that they do not need any assistance to extract and review "electronic" information. However, this apparent equivalency is false, as there are many nuances and complications associated with the forensically valid recovery of "electronic" information. "Hard copy" files are tangible, easily retrievable by anyone with "physical" access, and usually do not need a forensic examiner to recover the information. Forensic analysis (if any) is done after the retrieval, and usually focuses on issues such as ownership, origin, source, and access. In contrast, "electronic" files are recorded in digital form (that is, as "1s and 0s"), and require translation by the computer's operating system to be rendered intelligible. Furthermore, the ease of retrieval depends on the file's location (active files, free space, or file slack), its condition (contiguous or fragmented), and any of a variety of protective measures (passwords, encryption, steganographic concealment, hard drive locking, etc.). Thus, a preliminary forensic analysis is required "up front" to identify and bypass protective measures, create a working copy, locate and extract relevant files, reconstruct fragmented files, recover deleted files, determine file creation, modifications, and last accessed dates and times, identify (if possible) who created the file, modified it, and last accessed it, identify how the file was placed on the computer (that is, was it created locally or was it added via an external drive (CD, floppy, thumb drive, etc.), the Internet, or an email message), and to determine associations and links to other files or their content, and so on. In short, far more complex than processing a filing cabinet.

## **The Crime Scene Model**

The "crime scene" model is an alternate perspective that views the "digital storage media" as a "crime scene" or "location." This model equates the media to a house that contains evidence in many different locations, some obvious and others well hidden. Thus, the files, folders, and partitions of the digital evidence are equivalent to the rooms, closets, furniture, and other items located in-house - and so the digital forensic examination can be conducted in a similar manner as a typical crime scene examination. The "scene" (digital media / house) is entered and the various locations (partitions, folders / rooms, furniture) are searched for evidence (electronic / physical). When evidence is located and identified it is collected / recovered and analyzed.

However, "crime scenes" are normally processed by individuals that have been highly trained in the forensically sound identification, recovery, preservation, and analysis of evidence. Criminal investigators, prosecutors, and intelligence analysts are generally not trained to process "crime scenes." In short, just as "physical" evidence must be sent to a crime laboratory for analysis, "electronic" evidence must be sent to a computer forensics laboratory for analysis - and it is imperative that only trained examiners be allowed to process "electronic" evidence to ensure its preservation, proper extraction, analysis, and eventual use in prosecutions.

Part II of this discussion will focus on highlighting the various complexities and pitfalls associated with conducting digital forensic examinations.

Questions or comments? E-mail: [Clayton.D.Schilling -at- usdoj.gov](mailto:Clayton.D.Schilling-usdoj.gov)

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## Information and Instructions for *Microgram Bulletin*

[Editor's Preface: The following information and instructions are derived from the *Microgram* website < <http://www.dea.gov/programs/forensicsci/microgram/index.html> >, and are provided here for the convenience of those subscribers who are only receiving hard "circulation" copies of *Microgram Bulletin* at their Offices.]

### **General Information**

*Microgram Bulletin* is a monthly newsletter published by the U.S. Drug Enforcement Administration's Office of Forensic Sciences, and is primarily intended to assist and serve forensic scientists concerned with the detection and analyses of suspected controlled substances for forensic/law enforcement purposes.

### **Access to *Microgram Bulletin***

*Microgram Bulletin* is unclassified (as of the January 2003 issue), and is published on the DEA public access website (see the above URL). At this time, *Microgram Bulletin* is available only electronically, and requires Internet access. Professional scientific and law enforcement personnel may request email notifications when new issues are posted (such notifications are not available to private citizens). The publications themselves are never sent electronically (that is, as attachments).

Requests to be added to the email notification list should preferably be submitted via email to the *Microgram* Editor at: [microgram-2007 -at- mailsnare.net](mailto:microgram-2007-at-mailsnare.net) Requests can also be mailed to: *Microgram* Editor, Drug Enforcement Administration, Office of Forensic Sciences, 2401 Jefferson Davis Highway, Alexandria, VA 22301. All requests to be added to the *Microgram* email notification list should include the following **Standard Contact Information**:

- \* The Full Name and Mailing Address of Submitting Laboratory or Office;
- \* The Full Name, Title (Laboratory Director, Assistant Special Agent in Charge, Librarian, etc.), Phone Number, FAX Number, and Preferred email Address of the Submitting Individual (Note that email notifications are mailed to titles, not names, in order to avoid problems arising from future personnel changes);
- \* If available, the generic email address for the Submitting Laboratory or Office;
- \* If a generic email address is not available, **one** private email address for an individual who is likely to be a long-term employee, who has a stable email address, and who will be responsible for forwarding *Microgram* information to all of the other employees in the requestor's Office (**Note that only one email address per Office will be honored**).

Requests to be removed from the *Microgram* email notification list, or to change an existing email address, should also be sent to the *Microgram* Editor. Such requests should include all of the pertinent Standard Contact Information detailed above, and also should provide both the previous and the new email addresses.

Email notification requests/changes are usually implemented within six weeks.



### Email Notifications (Additional Comments)

As noted above, the email notification indicates which issue has been posted, provides the *Microgram* URL, and additional information as appropriate. Note that *Microgram* e-notices will NEVER include any attachments, or any hyperlink other than the *Microgram* URL. **This is important, because the Microgram email address is routinely hijacked and used to send spam, very commonly including malicious attachments.** For this reason, all subscribers are urged to have current anti-viral, anti-spyware, and firewall programs in operation. However, in order to ensure that the email notifications are not filtered as spam, the [microgram-2007 -at- mailsnare](mailto:microgram-2007-at-mailsnare) email address must be “whitelisted” by the Office’s ISP.

### Costs

Access to *Microgram Bulletin* is free.

### Submissions to Microgram Bulletin

*Microgram Bulletin* includes Intelligence Alerts, Intelligence Briefs, Safety Alerts, Selected Intelligence Briefs, Selected Literature References, Meeting Announcements, Employment Opportunities, pertinent sections from the Code of Federal Regulations, Columns of topical importance, and similar material of interest to the counter-drug community. Explanatory details for most of the above types of submission are detailed below, and typical examples are published in most issues of *Microgram Bulletin*.

All submissions must be in English. Because *Microgram Bulletin* is unclassified, **case sensitive information should not be submitted!** All submissions should, whenever possible, be submitted electronically, as straight email or as an IBM® PC-compatible Corel WordPerfect® or Microsoft Word® attachment, to: [microgram-2007 -at- mailsnare.net](mailto:microgram-2007-at-mailsnare.net) Current versions of Corel WordPerfect® or Microsoft Word® (defined as having release dates less than 5 years old) should be utilized. If email submission is not possible, submissions may be mailed to: *Microgram* Editor, Drug Enforcement Administration, Office of Forensic Sciences, 2401 Jefferson Davis Highway, Alexandria, VA 22301. Hard copy mailings should be accompanied by an electronic version on either a 3 ½ inch IBM® PC-compatible diskette or a standard CD-R. **Note that diskettes should be mailed in an irradiation-proof protective sleeve, and the mailing envelope should be marked: “Warning - Contains Electronic Media - Do Not Irradiate”.** Note also that mailed submissions may be subject to lengthy handling delays beyond the control of the Office of Forensic Sciences, and electronic media sent through the mail may be destroyed en route by sanitizing procedures, despite protective measures and written warnings. All submissions should include the following **Contact Information:** The Full Name and Address of Submitting Laboratory or Office, and the Full Name, Phone Number, FAX Number, and Preferred email Address of the Submitting Individual.

**Intelligence Alerts and Briefs** are concise synopses of the physical and chemical characteristics of novel and/or interesting exhibits submitted to law enforcement laboratories involved in the detection and analyses of suspected controlled substances for forensic/law enforcement purposes. Alerts have some unusual aspect, such as a novel drug, an atypical formulation, or a new smuggling technique, whereas Briefs are reports of routine analyses (that is, that confirmed what was suspected/expected). Both Alerts and Briefs should include descriptive details adhering to (as appropriate) the following outline:

What laboratory did the analysis? (Full Name)

Where is the laboratory located?

What agency seized the exhibit?

Where was the exhibit seized? (If an obscure locale, give distance and direction from the nearest city)

Were there any interesting (but non-sensitive) aspects of the seizure (traffic stop, unusual smuggling technique, at a “Rave,” etc.)

What controlled substance was suspected upon submission?  
Detailed physical description (appearance, dimensions, logos, odor, packaging, etc.)  
Quantities (numbers of tablets, packages or bricks, average mass, total net mass, etc.)  
Photos (see additional information, below)  
What techniques were used to analyze the exhibit?  
Actual composition of the exhibit?  
Quantitation data? (if not quantitated, provide a qualitative approximation if possible)  
Adulterants and diluents? (if identified, especially if unusual)  
First seizure of this type? (if not, provide brief details of previous examples)  
Editorial comments? (if any)  
Literature references for unusual submissions? (if needed)

In order to avoid confusion, if uncommon controlled substances are identified, the description should use the full chemical name(s) of the identified substances (if desired, acronyms or street terminology (e.g., “Foxy-Methoxy”, “Nexus”, or “STP”) can be included in parentheses after the full chemical name).

**Photographs should be provided as ATTACHMENTS, not as embedded images in documents.** Jpeg images are preferred. Photographs should be of reasonable size - 250 KB or less per photograph. Unless the scale is obvious, photographs of subject exhibit(s) should include either a metric ruled scale or a coin or bill (U.S. currency) to place the exhibit’s size in context.

**Safety Alerts** are urgent communiques to the *Microgram Bulletin* readership which give notice of a specific safety issue of particular interest to forensic or crime laboratory personnel, or to law enforcement personnel dealing with controlled substances. They should include a concise synopsis of the incident(s), recommendations (if any), pertinent literature citations (if any are known), and a mechanism for providing feedback (if appropriate).

**Selected Intelligence Briefs** are reprinted (with permission) unclassified intelligence briefs of presumed interest to the *Microgram Bulletin* readership that have been previously published in restricted or non-restricted publications or websites that are also dedicated to the detection and analyses of suspected controlled substances for forensic/law enforcement purposes. Selected Intelligence Briefs must be unclassified, and should be a minimum of 1 page and a maximum of 10 pages in length (single spaced at 11 pitch Times New Roman font, including photos, tables, charts, etc.) All *Microgram Bulletin* subscribers are invited to submit such material, which must include the author’s and publisher’s contact information.

**Selected Literature References** is a monthly compilation of reference citations of presumed interest to the *Microgram Bulletin* readership, derived from approximately 7,500 scientific periodicals. The focus of the Selected Literature References is the detection and analysis of suspected controlled substances for forensic/law enforcement purposes. References from clinical and toxicological journals are included only if the material is considered to be of high interest to forensic chemists (for example, contains the mass spectra of an unusual substance that is not known to be published elsewhere). Note that citations from obscure periodicals may be missed, and all *Microgram Bulletin* subscribers are invited to submit citations of interest if they do not appear in *Microgram Bulletin* within three months of their publication. Of particular interest are articles from regional forensic science associations that are unlikely to be noted by any abstracting service. Citations should include a summary sentence and the primary author’s contact information.

**Meeting Announcements** list upcoming meetings of presumed interest to the *Microgram Bulletin* readership. **In general, only meetings which are dedicated to forensic chemistry/forensic drug analysis or include a subsection so dedicated will be publicized in *Microgram Bulletin*.** Meeting Announcements should include the Formal Title, Sponsoring Organization, Inclusive Dates, Location

(City, State, and specific locale), Registration Deadline, Recommended Hotel (include details on special rates and deadlines where applicable), and Contact Individual's Name, Phone Number, and email Address. If available, the URL for the meeting website should also be included in the Announcement. Meeting Announcements will be posted for a maximum of three consecutive months, or (alternately) three times every other month over a five month period, but not past the registration deadline.

**Employment Opportunities** lists job announcements of presumed interest to the *Microgram Bulletin* readership. **In general, only jobs with a forensic chemistry/forensic drug analysis focus for Federal, State, or Local Crime Laboratories or Offices will be publicized in *Microgram Bulletin*.** Exceptions may be requested and will be considered on a case-by-case basis (for example, an academic position in a Forensic Chemistry Department). Employment Opportunity announcements should include the Formal Title of the Organization, Formal Title of the Laboratory or Office, Position Title, Laboratory or Office Location (City and State), Salary Range, Opening and Closing Dates, Duties, General Requirements, Specialized Requirements (if any), Application Procedures, and the Contact Individual's Name, Phone Number, email Address, and Mailing Address. If available, the URL for the agency's website, and (if available) the specific URL for the job posting should also be included in the Announcement. Employment Opportunities will be posted for a maximum of 3 consecutive months, but not past the application deadline.

#### **The Journal/Textbook Collection Exchange**

If any subscriber is interested in donating any forensic or analytical chemistry journal and/or textbook collection to a fellow subscriber or library, *Microgram Bulletin* is willing to list the offered materials and the associated contact information in a future issue (currently January, April, July, and October). The general format should follow the example in the January 2003 issue, and should be sent via email to the *Microgram* Editor at: [microgram-2007 -at- mailsnare.net](mailto:microgram-2007-at-mailsnare.net) Only items for donation (not for sale) will be considered for publication, and donations to libraries should adhere to journal restrictions and/or time limits (if any) on such offers.

#### **Requests for *Microgram* and/or *Microgram Bulletin* Archives, 1967 - 2002**

All issues of *Microgram* (November 1967 - March 2002) and the first nine issues of its successor *Microgram Bulletin* (April - December 2002) were and continue to be **Law Enforcement Restricted** publications, and are therefore (permanently) unavailable to the general public. [Note that this restriction includes requests made under the Freedom of Information (FOI) Act.]

However, past issues or individual sections of issues (e.g., specific articles) are available to law enforcement affiliated offices and laboratories. Requests from such offices and laboratories **must be made on official letterhead** and mailed to:

Deputy Assistant Administrator  
Office of Forensic Sciences  
Drug Enforcement Administration  
2401 Jefferson Davis Highway  
Alexandria, VA 22301

Note that requests made via email will not be honored.

## DISCLAIMERS

1) All material published in *Microgram Bulletin* is reviewed prior to publication. However, **the reliability and accuracy of all published information are the responsibility of the respective contributors, and publication in *Microgram Bulletin* implies no endorsement by the United States Department of Justice or the Drug Enforcement Administration.**

2) Due to the ease of scanning, copying, electronic manipulation, and/or reprinting, **only the posted copies of *Microgram Bulletin* (on [www.dea.gov](http://www.dea.gov)) are absolutely valid.** All other copies, whether electronic or hard, are necessarily suspect unless verified against the posted versions.

3) **WARNING!:** Due to the often lengthy time delays between the actual dates of seizures and their subsequent reporting in *Microgram Bulletin*, and also because of the often wide variety of seizure types with superficially similar physical attributes, published material cannot be utilized to visually identify controlled substances currently circulating in clandestine markets. **The United States Department of Justice and the Drug Enforcement Administration assume no liability for the use or misuse of the information published in *Microgram Bulletin*.**

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# Microgram

## *Bulletin*

**Published by:**

The Drug Enforcement Administration  
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Washington, DC 20537

The U.S. Attorney General has determined that the publication of this periodical is necessary in the transaction of the public business required by the Department of Justice. Information, instructions, and disclaimers are published in the January issues.

**- FEBRUARY 2007 -**

**- INTELLIGENCE ALERT -**

### **ECSTASY MIMIC TABLETS (CONTAINING KETAMINE AND METHAMPHETAMINE) IN UKIAH AND EUREKA, CALIFORNIA**

The California Department of Justice Forensic Laboratory in Eureka (approximately 250 miles north of San Francisco) recently received two separate submissions of identical tablets, blue in color and having the yin-yang symbol logo on one face and half-scored on the obverse face, suspected Ecstasy (see Photo 1). The first submission (2 tablets) was seized in Ukiah (approximately 100 miles north of San Francisco) by the Ukiah Police, while the second submission (20 tablets) was seized in Eureka by the Eureka Police (circumstances not provided for either seizure). Analysis by GC/MS, however, indicated not MDMA but rather a mixture of ketamine and methamphetamine (not quantitated, but in approximately a 10:1 ratio based on the TIC). This is the first submission of ketamine in tablet form to the laboratory.



**Photo 1**

**- INTELLIGENCE ALERT -**

**ECSTASY MIMIC TABLETS (CONTAINING N-(2,4,6-TRIMETHYLPHENYL)-  
PHTHALIMIDE) IN OSAKA, JAPAN**

The Forensic Science Laboratory of the Osaka Prefectural Police Headquarters (Japan) recently received 11 mottled, brownish-pink tablets with an “S” logo, suspected Ecstasy (see Photo 2). The exhibits were seized by the Osaka Prefectural Police from two users in Osaka city. The tablets were 6.2 millimeters in diameter, 4.5 millimeters thick, and averaged 130 milligrams each. Analysis by color testing, TLC, and GC/MS, however, indicated no controlled substances. Additional analyses by GC/CI-MS, LC/MS/MS and NMR analyses indicated N-(2,4,6-trimethylphenyl)phthalimide (approximately 15 milligrams/tablet) along with lesser amounts of one of its probable precursors, 2,4,6-trimethylaniline. Very little information is available concerning this compound; based on its structure, it may have a sedative effect (and the users so claimed). An internet search on N-phenyl phthalimides indicates derivatives with herbicidal, anticancer, and other, rather obscure pharmaceutical activities - but no derivatives with any known abuse potential. To our knowledge, this is the first report of N-(2,4,6-trimethylphenyl)phthalimide in any clandestine sample. Since this submission, more than 300 tablets of the same kind have reportedly been seized in Osaka, Tokyo, Iwate, Kagawa, and several other Prefectures in Japan.



**Photo 2**

\* \* \* \* \*

**- INTELLIGENCE ALERT -**

**LARGE POLYDRUG SEIZURE NEAR SALEM, OREGON**

The Oregon State Police Forensics Lab in Springfield recently received a multi-exhibit submission including 3 types of blotter papers (see Photos 3 and 4, next page), 6 bags of powder (2 of which were labelled with printed stickers: “2-(4-Ethyl-2,5-dimethoxyphenyl)ethylamine” (2C-E)), a bottle of colorless liquid, 7 small vials of red liquid with an odor of strawberries (1 broken), 52 clear gelatin capsules containing a white powder, 16 pharmaceutical tablets (apparent oxycodone, several different formulations), and 44 Ecstasy-type tablets (17 different logos, see next page) sorted and bagged by logo type. The exhibits were seized by the Oregon State Police - Salem Area Patrol Office pursuant to a traffic stop, and (unusually) were found in a safe in the trunk of the vehicle. Marijuana and mushrooms were reportedly also seized, but were not submitted for analysis.

Analyses were done via color testing, GC/MS, and FTIR, as appropriate. None of the samples were quantitated. Analysis of the blotter papers confirmed LSD in one sample (72 units) and indicated 4-iodo-2,5-dimethoxyphenethylamine (2C-I) in the other two sample types (totalling 79 units). Of interest, one of the latter two blotter papers also contained trace amounts of MDMA and methamphetamine (both confirmed) and MDA and caffeine (neither confirmed). Two of the powders (total net mass 1.2 grams) were identified as MDMA, 2 (total net mass 4.93





**Photo 3**



**Photo 4**

grams) were consistent with 2C-I, and 2 were residues consistent with a mixture of 2C-I and 2C-E (these were the labelled bags). The colorless liquid (total net volume 100 milliliters) was identified as 1,4-butanediol. The red liquids in the small vials (approximate total net volume in the 6 intact vials 6 milliliters) and the powder in the gelatin tablets (gross mass 3.35 g) were all consistent with 2C-I. The logos and presumptive testing of the pharmaceutical tablets gave results that were consistent with oxycodone. Of the 17 different types of Ecstasy-type tablets, 4 were analyzed; all 4 contained MDMA and 1 also contained ketamine.

#### Blotter Papers

- 1: Fractal Face (72 Units); Analysis: LSD (see Photo 3)
- 2: Yellow Elephants (2-Sided Blotter Paper, 75 Units); Analysis: 2C-I (see Photo 4)
- 3: Multicolor (4 Units); Analysis: 2C-I and multiple trace compounds (photo not shown)

#### Ecstasy Logos

- 1: "RB," 8; Analysis: MDMA
- 2: Hammer, 3; Analysis: MDMA
- 3: "K&K," 3; Analysis: MDMA/Ketamine
- 4: "Fu," 4; Analysis: MDMA
- 5: Cobras, 2
- 6: Reclining Woman, 2
- 7: Pac-man, 2
- 8: Smiley, 2
- 9: Mitsubishi, 2
- 10: Adidas, 2
- 11: Puma, 2
- 12: Dolphin, 2
- 13: X-Box, 3
- 14: Omega (Greek letter), 1
- 15: Musical Note, 2
- 16: (Illegible)
- 17: (Illegible)

(Continued on Next Page)

This is believed to be the first submission of 1,4-butanediol to this laboratory, and the largest and also the most varied submission of 2C-I. The exhibits “consistent with” 2C-I and 2C-E were not confirmed due to lack of authenticated standards. LSD blotter paper submissions to the laboratory are uncommon. This laboratory has seen a distinct rise in the number of submissions of designer phenethylamines and tryptamines (both controlled and non-controlled) over the past two years.

\* \* \* \* \*

**- INTELLIGENCE ALERT -**

**HEROIN SOLUTIONS IN JUICE BOXES AT JFK AIRPORT**

The DEA Northeast Laboratory (New York, New York) recently received 14 juice boxes suspected of containing heroin solutions (see Photo 5). The exhibits were seized by Immigration and Customs Enforcement from a passenger arriving at JFK International Airport (details sensitive). Analysis of the liquid (total net volume 3169 milliliters) by GC/FID, NMR, GC/MS, and FT-IR/ATR confirmed 52 percent heroin hydrochloride. The Northeast Laboratory routinely receives exhibits containing cocaine solutions, but rarely receives exhibits containing heroin solutions.



**Photo 5**

\* \* \* \* \*

**- INTELLIGENCE ALERT -**

**CAFFEINE/LIDOCAINE MIXTURES (CONTAINING TRACE HEROIN)  
IN FONTANA, CALIFORNIA**

The DEA Southwest Laboratory (Vista, California) recently received two exhibits, one a tan powder (total net mass 3,111 grams) and the other a tan paste (total net mass 1,039 grams), both having a distinct vinegar odor, that field-tested positive for cocaine (see Photo 6). The exhibits were seized by DEA personnel pursuant to the execution of a state search warrant at a residence in Fontana, California (approximately 10 miles west of San



**Photo 6**

Bernardino). Preliminary analysis by FTIR/ATR, GC, and GC/MS, however, indicated not cocaine but rather a mixture of caffeine and lidocaine, possibly containing trace heroin. Dissolution of a small portion of each exhibit in 2.8 N HCl solution, followed by extraction with chloroform, with secondary analysis of the extract with GC and GC/MS confirmed heroin (approximately 0.08 percent in the powder and 0.15 percent in the paste). It is unknown whether the exhibits were intended for use as cutting agents, or were designed as sham narcotics, or for some other purpose.

\* \* \* \* \*

### **- INTELLIGENCE BRIEF -**

### **VERY LARGE SEIZURE OF "ICE" METHAMPHETAMINE IN GAINESVILLE, GEORGIA**

The DEA Southeast Laboratory (Miami, Florida) recently received 14 boxes of cellophane-wrapped bales of tape-wrapped Tupperware® containers of crystalline material, suspected "Ice" methamphetamine (see Photos 7 - 9).

There were two different sizes of containers, 8 x 5 x inches and 5 x 5 x 2 inches. The exhibits were seized by Bureau of Alcohol, Tobacco, and Firearms personnel pursuant to the execution of a search warrant in Gainesville, Georgia (no further details).

Analysis of the material (total net mass 125.9 kilograms) by GC/FID, NMR, Raman, GC/MS, and FTIR confirmed 85 percent methamphetamine hydrochloride, cut with dimethyl sulfone (DMS, not quantitated). This is the first submission of "Ice" methamphetamine in this type of packaging, and is also one of the largest ever submissions of "Ice" methamphetamine, to the Southeast Laboratory.



**Photo 7**



**Photo 8**



**Photo 9**



**- INTELLIGENCE BRIEF -**

**LARGE QUANTITIES OF VERY HIGH PURITY “ICE” METHAMPHETAMINE  
BEING ENCOUNTERED ALONG THE MEXICO/TEXAS BORDER**

The DEA South Central Laboratory (Dallas, Texas) has recently received several submissions of large quantities of unusually pure d-methamphetamine HCl (“Ice”). The submissions are from seizures made along the Mexico/Texas border by personnel from Immigration and Customs Enforcement, Border Patrol, and/or the DEA. Three recent such seizures included: A) Pharr - 11.04 kilograms, 99.6+ percent; B) Eagle Pass - 7.56 kilograms, 99.0 percent; and C) Sarita - 27.08 kilograms, 99.8 percent. Analyses were conducted with a combination of GC/MS, FTIR, NMR, and HPLC. While these are not the first submissions of this type to the laboratory, it is very unusual for this laboratory to have multiple submissions of 99 percent plus purity “Ice” methamphetamine in such large quantities.

[Editor’s Comment: Restrictions on the domestic sales of ephedrine- and pseudoephedrine-containing products have had a significant impact on small-scale, domestic production of methamphetamine. As a result, Mexican-based Drug Trafficking Organizations have moved quickly to fill the void with increased production of “Ice” methamphetamine.]

\* \* \* \* \*

**- FOLLOWUP / CLARIFICATION -**

**BLOTTER ACID MIMICS (CONTAINING  
4-BROMO-2,5-DIMETHOXYAMPHETAMINE  
(DOB)) IN CONCORD, CALIFORNIA**

Sir: The “ornate wheel-burst pattern surrounding a heart” logo pictured in the above referenced Intelligence Alert (Microgram Bulletin 2006;39(11):136; see Photo 10) is a variation of the logo of a large techno event in Germany, the Loveparade; see: <http://www.loveparade.net>



**Photo 10**

F. Padjen (Germany)

\* \* \* \* \*

**SELECTED REFERENCES**

[Selected references are a compilation of recent publications of presumed interest to forensic chemists. Unless otherwise stated, all listed citations are published in English. Abbreviated mailing address information duplicates that provided by the abstracting service. Patents and Proceedings are reported only by their *Chemical Abstracts* citation number.]

1. Amundsen LK, Siren H. **Partial filling micellar electrokinetic chromatography analysis of androgens and testosterone derivatives using two sequential pseudostationary phases.** Journal of Chromatography A 2006;1131(1-2):267. [Editor’s Notes: Presents the title study;

the technique separated androstenedione, testosterone, epitestosterone, fluoxymesterone, and methyltestosterone. Contact: VTT, POB 1000, FIN-02044 Espoo, Finland.]

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## EMPLOYMENT OPPORTUNITIES

Position: **Forensic Chemist**

(Third and Final Posting)

Location: Indian River Crime Laboratory; Fort Pierce, Florida

Salary: \$55,000 – \$65,000 depending on experience

Application Deadline: Open until filled

Duties: Responsibilities include the analysis of controlled substances; interpretation of laboratory analyses and results; preparation of written reports; and the ability to testify as an expert witness.

General Requirements: The applicant must be skilled in using gas chromatography, mass spectroscopy, ultraviolet and infrared spectrophotometry, and other drug analysis equipment and methodologies. A familiarity with the technical and safety requirements of ASCLD/LAB, and demonstrated proficiency



testing in controlled substance analysis are required. A Master's degree in chemistry or forensic science (with chemistry undergraduate degree) and two years of forensic laboratory experience are preferred. Experience in head-space BAC analysis is desirable. An extensive background investigation is required, and laboratory personnel are subject to random drug testing. EEO.

Application Procedure: Applications may be obtained on-line at [stluciesheriff.com](http://stluciesheriff.com) or by contacting:

Saint Lucie County Sheriff's Office  
Human Resources Department  
4700 W. Midway Road  
Fort Pierce, FL 34981-4825  
Phone: (772) 462-3206  
Fax: (772) 462-3218

For additional information about the position, contact:

Daniel C. Nippes, Director (or) Babu Thomas, Senior Criminalist  
Indian River Crime Laboratory  
2502 S. 35th Street  
Fort Pierce, FL 34981  
[dnippes-at-ircc.edu](mailto:dnippes-at-ircc.edu) (or) [bthomas-at-ircc.edu](mailto:bthomas-at-ircc.edu)  
Phone: (772) 462-3600

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# Computer Corner

# #214

## Who is Qualified to Conduct Forensic Examinations of Digital Evidence? - Differing Points of View - Part II

by Clay Schilling  
Group Supervisor  
DEA Digital Evidence Laboratory

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Part I of this column (Computer Corner #213) introduced the issue of who is best qualified to conduct computer forensic examinations and identified some possible misunderstandings or misconceptions on what digital evidence is and how (by whom) it should - and should not - be processed. Part II will further explore some of the inherent differences in the knowledge, skills, and abilities that are required to conduct criminal investigations, criminal prosecutions, criminal intelligence analyses, and digital evidence analyses.

In order to perform the varied and extensive tasks required of criminal investigations, criminal prosecutions, criminal intelligence analyses, and related sub-fields, extensive and highly focused training and practical experience are required. Similarly, in order to conduct digital forensic examinations, the analyst must have an in-depth understanding of computer technology, legal procedures, laws of evidence, information analysis, and investigative techniques, as required for this specialization. However, while there are some commonalities, the specific knowledge, skills, and abilities needed in each field are significantly different.

Criminal investigators have to be familiar with the procedures, techniques, legal concerns, and general problems associated with conducting criminal investigations. They receive training in areas such as law and court procedures, identification, collection, and handling of evidence, crime scene processing, interviewing techniques, investigative techniques for several different types of crimes, case documentation, report writing, file management, weapons, and use of force.

Similarly, criminal prosecutors are familiar with statutory and common laws that deal with crime and the legal punishment of criminal offenses. They receive training in areas such as criminal and civil law, evidence procedures, case documentation, legal writing, file management, legal research, negotiation, oral advocacy, and court procedures.

Finally, criminal intelligence analysts are familiar with collecting, processing, analyzing, and reporting criminal intelligence information. They receive training in areas such as collection techniques, priority target identification, information organization, processing and analysis methods, and intelligence reporting. They compile and analyze case related data, track criminal events or crime trends, perform timeline or event analyses, identify co-conspirators, link individuals and organizations, track funding sources, identify missing case elements, develop leads, differentiate relevancy, identify exculpatory information, or identify and properly react to indications of another crime such as child pornography.

Digital forensic examiners are familiar with the application of the scientific method to identify, preserve, examine, extract, and document digital evidence. Digital forensic examiners must possess a broad understanding of computer technology, legal procedures, rules of evidence, information analysis, and investigative techniques. Digital forensic examiners receive continuous training in areas such as computer hardware and software, various file systems (e.g., Windows, Linux, SCO Unix, and Macintosh), file system artifacts (e.g., file allocation tables, system registry files, date/time stamps, metadata, Internet files, temp files, and swap files), digital evidence identification and acquisition using various forensic tools and evidence preservation methods, evidence handling, legal procedures, and investigative and analytical techniques.

During the examinations, digital evidence examiners adhere to the rules of evidence and other legal processes ensuring evidence preservation and integrity. They also use analytical skills and practical experience to locate, compare, and separate relevant information. They maintain a neutral position extracting both probative and exculpatory information and provide factual reports documenting the information found. Following the examination, they use their knowledge of court procedures to testify as expert witnesses, expressing technical details in a manner that is easily understood by the court and jury, and are able to authenticate all discovered information.

Criminal investigators, criminal prosecutors, criminal intelligence analysts and digital evidence examiners can bring diverse expertise to an investigation and prosecution that involves digital evidence. The combined expertise of these varied disciplines assist the digital evidence examiner in differentiating relevancy, identifying exculpatory information, or identifying and properly reacting to indications of other crimes that may not be directly related to the initial investigation. The knowledge, skills, and abilities of each field must be maintained as technology and law changes. While the digital evidence examiner's role is vitally important in maintaining the integrity of digital evidence, it is important for each person to bring to their expertise to the investigation, as well as, an awareness of the roles of the others.

Questions or comments? E-mail: [Clayton.D.Schilling -at- usdoj.gov](mailto:Clayton.D.Schilling@usdoj.gov)

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# Microgram

## *Bulletin*

**Published by:**

The Drug Enforcement Administration  
Office of Forensic Sciences  
Washington, DC 20537

The U.S. Attorney General has determined that the publication of this periodical is necessary in the transaction of the public business required by the Department of Justice. Information, instructions, and disclaimers are published in the January issues.

**- MARCH 2007 -**

**- INTELLIGENCE ALERT -**

### **METHAMPHETAMINE IN COTTON BALLS IN JOHNSON COUNTY, KANSAS**

The Johnson County Sheriff's Office Criminalistics Laboratory (Mission, Kansas) has recently received multiple submissions of small, irregularly shaped cotton balls impregnated with a white, crystalline powder, suspected methamphetamine (see Photo 1). The exhibits were obtained as a result of multiple, independent enforcement actions in various jurisdictions in Johnson County (which includes the southern suburbs of Kansas City). One recent polydrug seizure included two plastic bags containing a total net mass of 1.44 grams of these cotton balls. Analysis of the powder by GC/MS indicated a mixture of methamphetamine and dimethylsulfone, similar to typical methamphetamine exhibits recently submitted to the laboratory. The exhibits were not quantitated, but the methamphetamine to dimethylsulfone ratios in the two bags were 1:1 and



**Photo 1**

2:3, respectively, based on their TIC's. The laboratory has previously seen these cotton balls, but only after having being used; in such cases, the balls were co-submitted with a spoon-like device, and the balls and spoons contained only residues. These were the first submissions of the pre-packaged, unused balls.

[Editor's Notes: According to the analyst, the exact manner in which the cotton balls are being used is unknown. The cotton balls may act as a crude filter, or perhaps are just a convenient support matrix that is visually innocuous.]

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### **- INTELLIGENCE ALERT -**

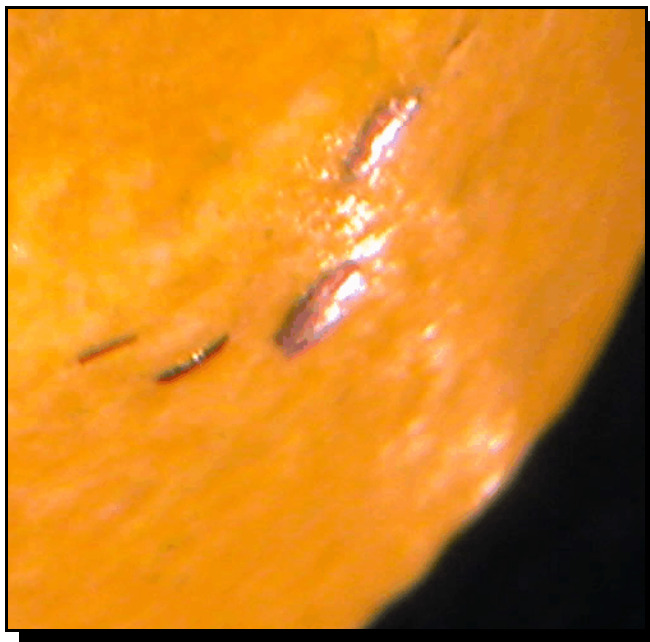
#### **ECSTASY TABLETS WITH GLITTER IN BIRMINGHAM, ALABAMA**

The Hoover Regional Laboratory of the Alabama Department of Forensic Sciences recently received 10 apparent Ecstasy tablets containing glitter, suspected MDMA (see Photos 2 and 3). The tablets were seized by the Birmingham Police Department (no further details). The seizure included 5 green and 5 yellow tablets (total net mass 2.74 grams); both types were 9 millimeters in diameter by 5 millimeters thick, and had a "waving man" logo. Analysis by color testing, GC/MS, FTIR/ATR, and microcrystal test indicated MDMA, nicotinamide (not confirmed), trace MDP2P, and trace methamphetamine. The exhibits were not quantitated, but the ratio of MDMA to nicotinamide was 37:2 based on the TIC. This is the first submission of Ecstasy tablets with glitter (and also of this logo type) to the laboratory.

[Editor's Notes: This also appears to be the first ever report of Ecstasy tablets containing glitter to *Microgram*; however, a similar submission was recently reported by the Maryland State Police-Forensic Sciences Division in Pikesville. The addition of glitter would appear to be a marketing tactic. It is unknown what health effects, if any, the presence of glitter would have on users who ingest these tablets.]



**Photo 2**



**Photo 3**



**- INTELLIGENCE ALERT -**

**CAPSULES CONTAINING HEROIN AND ALPRAZOLAM  
NEAR SAVAGE, MARYLAND**

The Howard County Forensic Chemist working out of the Maryland State Police-Forensic Sciences Division (Pikesville) recently received a polydrug submission that included two clear plastic capsules (total net mass 0.7 grams) containing an off-white, tannish powder, suspected heroin (see Photo 4). The exhibits were seized by the Howard County Police Department pursuant to a traffic stop near Savage (located just off of I-95 between Washington, DC and Baltimore, Maryland). Analysis of the powder by color testing and GC/MS indicated a mixture of acetaminophen, caffeine, heroin, and alprazolam. The exhibit was not quantitated, but the ratio of heroin to alprazolam was approximately 2:3, based on the TIC. This was the first known submission of capsules containing a mixture of heroin and alprazolam to the laboratory.



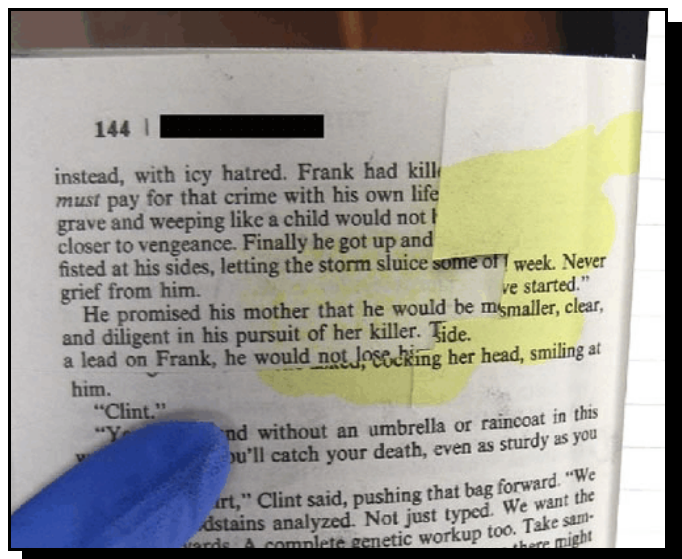
**Photo 4**

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**- INTELLIGENCE ALERT -**

**PAPERBACK NOVEL LACED WITH METHAMPHETAMINE AT THE  
WASHINGTON COUNTY JAIL, FAYETTEVILLE, ARKANSAS**

The Arkansas State Crime Laboratory (Little Rock) recently received a paperback novel that had apparent yellow highlighter stains on several pages, that field-tested positive for methamphetamine (see Photo 5). The exhibit was seized by the Washington County Sheriff's Office from an individual who was visiting the Washington County Jail (located in Fayetteville). Analysis of a methanolic extract of the most heavily stained pages by color testing, TLC, and GC/MS confirmed methamphetamine (not quantitated, but a high loading based on TIC). This is the first seizure of this type submitted to the laboratory.



**Photo 5**

**- INTELLIGENCE ALERT -**

**SODAS MIXED WITH COUGH SYRUP  
(CONTAINING CODEINE AND PROMETHAZINE)  
IN MOBILE, ALABAMA**

The Alabama Department of Forensic Sciences, Mobile Laboratory, has recently received numerous submissions of plastic soda bottles containing either a pink or purple liquid, suspected to contain codeine (see Photo 6). These solutions are locally known as “Sip-Sip” and “Lean,” and have been seized by several law enforcement agencies in the Mobile area, including the Prichard Police Department, Mobile Police Department, and the Mobile County Sheriff’s Office. Following acid/base workup, analysis of chloroform extracts by GC/MS indicated a mixture of codeine and promethazine (not formally quantitated, but both present in only low concentrations, in approximately a 1:3 ratio). The solutions are believed to be sodas containing added prescription cough syrup.



**Photo 6**

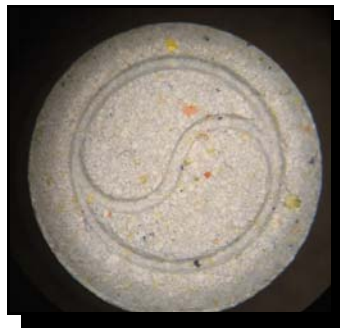
[Editor’s Note: Promethazine is an antihistaminic.]

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**- INTELLIGENCE ALERT -**

**ECSTASY MIMIC TABLETS (CONTAINING KETAMINE, METHAMPHETAMINE,  
AND DIMETHYLSULFONE) IN SAN JOSE, CALIFORNIA**

The DEA Western Laboratory (San Francisco, California) recently received two exhibits of apparent Ecstasy tablets, all 9 millimeters in diameter by 4 millimeters thick, suspected MDMA (see Photos 7 and 8 (colors not true)). The exhibits were acquired by the Santa Clara County Sheriff’s Office (no further details). The first exhibit contained two multicolored



**Photo 7**



**Photo 8**

speckled blue tablets (total net mass 249 milligrams) with a ying/yang logo on one side and a score mark on the opposite side. The second exhibit contained two multicolored speckled pink tablets (total net mass 256 milligrams) with a crown logo. Analysis of both exhibits by GC and GC/IRD, however, identified not MDMA but rather a mixture of ketamine, methamphetamine, and dimethylsulfone. The drug components were not formally quantitated, but were estimated as 4.1 percent ketamine and 0.4 percent methamphetamine in the ying/yang logo tablets, and 1.4



percent ketamine and 0.7 percent methamphetamine in the crown logo tablets. This is believed to be the first submission of Ecstasy mimic tablets containing a mixture of ketamine and methamphetamine to the Western Laboratory.

[Editor's Note: The ying/yang logo tablets appear to be the same as those reported by the California Department of Justice Forensic Laboratory in Eureka in the February 2007 issue of *Microgram Bulletin*.]

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## **- INTELLIGENCE ALERT -**

### **HEROIN BRICKS IN HAMMOND, INDIANA**

The DEA North Central Laboratory (Chicago, Illinois) recently received 3 full and 1 half bricks of extremely hard, light grayish brown powder with 2 different embossed images, suspected heroin. The exhibits were seized by the Indiana State Police pursuant to a traffic stop near Hammond (located at the far northwestern corner of Indiana, about 30 miles south-southeast of Chicago, Illinois). The first full brick (total net mass 1031.2 grams) had the word "CAPRICORNIO" over a Ram's Head logo (see Photo 9), whereas the other 2 full bricks and the half brick (total net mass 2587.5 grams) had a Scorpion logo (see Photo 10), without lettering (partial logo on the half-brick). Unusually, the bricks resembled kilogram bricks of cocaine in both their packaging and dimensions (wrapped in plastic food bags, plastic shrink wrap, tape, and carbon paper, and rectangular (full brick approximately 7.5 x 4.5 x 1 inches)). Analysis by GC/MS, IR, and GC/FID confirmed 90 percent heroin hydrochloride. This was the first submission of heroin bricks shaped, wrapped, and branded like cocaine bricks to the North Central Laboratory in many years.

[Editor's Note: The Ram's Head / "Capricornio" brick appears to be the same as those reported by the DEA South Central Laboratory in the December 2006 issue of *Microgram Bulletin* (the latter seizure (13 bricks) was made at the Laredo, Texas POE).]



**Photo 9**



**Photo 10**

## COWBOY BOOTS CONTAINING COCAINE AT THE WASHINGTON-DULLES INTERNATIONAL AIRPORT

The DEA Mid-Atlantic Laboratory (Largo, Maryland) recently received 6 boxes that contained 26 pairs of cowboy boots, 25 pairs of which contained a clear plastic bag of white powder in the heel of each boot, suspected cocaine (see Photo 11). The boxes arrived as air cargo at Washington-Dulles International Airport, and were seized by Immigration and Customs Enforcement personnel (no further details). Analysis of the powder (total net mass 2.707 kilograms) by FTIR, GC, and GC/MS confirmed cocaine hydrochloride in all of the exhibits, ranging in purity from 64 to 76 percent. Four of the exhibits were adulterated with caffeine, and one was adulterated with diltiazem. The Mid-Atlantic Laboratory has previously received similar exhibits.

**Photo 11**

\* \* \* \* \*

**- INTELLIGENCE ALERT -**

## TOILETRIES CONTAINING HEROIN (FROM COLOMBIA) IN NEW YORK

The DEA Northeast Laboratory (New York, New York) recently received a set of toiletries, each containing a tan colored powder, suspected heroin (see Photo 12). The exhibits (two hairbrushes, two makeup foundation applicators, and a makeup brush) were seized by Immigration and Customs Enforcement personnel from a passenger arriving on a flight from Colombia (details sensitive). Analysis of the powder (total net mass 130.2 grams) by GC/FID, NMR, GC/MS, and FTIR/ATR confirmed 89 percent heroin hydrochloride. The Northeast Laboratory routinely receives heroin concealed in various types of containers, including in shampoo bottles and secreted inside other types of toiletries.



### Photo 12

**- INTELLIGENCE ALERT -**

**(POSSIBLE) PLASTIC BOTTLE STOPPER (CONTAINING COCAINE) SEIZED  
AT EZEIZA AIRPORT IN BUENOS AIRES, ARGENTINA**

The DEA Special Testing and Research Laboratory (Dulles, Virginia) recently received a reddish-brown, hard plastic tube resembling a cork that contained a white powder, suspected cocaine (see Photo 13). The exhibit was seized by Argentinean Airport Security Police at the Ezeiza Airport in Buenos Aires, from two Polish nationals who were boarding a flight to Chile. Analysis of the powder (total net mass 7.2 grams) by GC, IR, and GC/MS confirmed 87.8 percent cocaine hydrochloride, 2.4 percent cocaine base, and 2.1 percent caffeine. This is the first submission of this type to the Special Testing and Research Laboratory.



**Photo 13**

\* \* \* \* \*

**SELECTED REFERENCES**

[Selected references are a compilation of recent publications of presumed interest to forensic chemists. Unless otherwise stated, all listed citations are published in English. Abbreviated mailing address information duplicates that provided by the abstracting service. Patents and Proceedings are reported only by their *Chemical Abstracts* citation number.]

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2. Mercer JW, Oldfield LS, Hoffman KN, Shakleya DM, Bell SC. **Comparative analysis of gamma-hydroxybutyrate and gamma-hydroxyvalerate using GC/MS and HPLC.** Journal of Forensic Sciences 2007;52(2):383. [Editor's Notes: GHB and GHV were derivatized with BSTFA with trimethylchlorosilane prior to GC/MS analyses. UV/Vis detection at 254 nm was used for the HPLC analyses. Contact: C. Eugene Bennett Department of Chemistry, West Virginia University, 217 Clark Hall, Morgantown, WV 26056.]
3. Morris JA. **Modified cobalt thiocyanate presumptive color test for ketamine hydrochloride.** Journal of Forensic Sciences 2007;52(1):84. [Editor's Notes: An alkaline version of the cobalt thiocyanate test was moderately sensitive and highly selective for ketamine. 93 other compounds were checked. Contact: Johnson County Sheriff's Office, Criminalistics Laboratory, 6000 Lamar, Mission, Kansas 66202.]

4. Nguyen XT, Hoang MH. **Stability of the impurities in heroin samples during storage.** Tap Chi Duoc Hoc 2006;46(10):21. [Editor's Notes: Used GC analysis to determine ratios of heroin, acetylcodeine, O6-monoacetylmorphine, and possibly other byproducts and impurities (not clear from the abstract). This article is written in Vietnamese. Contact: Criminal Science Dept., Bureau of Public Security, Vietnam.]
  
5. Ojanpera S, Ojanpera I. **Forensic drug screening by LC-MS using accurate mass measurement.** LC-GC Europe 2005;18(11):607. [Editor's Notes: Uses LC/TOF-MS; focus appears to be toxicological, but "analysis of drugs of abuse in seized street drug samples" is specifically mentioned in the abstract. Contact: Department of Forensic Medicine, University of Helsinki, Finland.]
  
6. Oliver TL. **Clandestine laboratory (Clan-Lab) home test kit system, protocol, method and apparatus.** (Patent) Chemical Abstracts 2006:1342029.
  
7. Osan TM, Cerioni LMC, Forgue J, Olle JM, Pusiol DJ. **NQR: From imaging to explosives and drugs detection.** (Patent) Chemical Abstracts 2006:1348733.
  
8. Osokin DY, Khusnutdinov RR. **Two-frequency composite pulses in NQR.** Applied Magnetic Resonance 2006;30(1):7. [Editor's Notes: Use of the title technique for detection of narcotics is specifically mentioned in the abstract (NFI). Contact: Kazan Physical-Technical Institute, Russian Academy of Sciences, Kazan, Russia.]
  
9. Sachs SB, Woo F. **A detailed mechanistic fragmentation analysis of methamphetamine and select regioisomers by GC/MS.** Journal of Forensic Sciences 2007;52(2):308. [Editor's Notes: Presents the title study. Includes methamphetamine and 7 related compounds. Contact: San Francisco Police Department Crime Laboratory, 850 Bryant St., San Francisco, CA 94103.]
  
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11. Zamir A, Cohen Y, Azoury M. **DNA profiling from heroin street dose packages.** Journal of Forensic Sciences 2007;52(2):389. [Editor's Notes: Presents the title study. DNA could be recovered from fingerprints along the "amorphous" burnt edges of the plastic wrap typically used to package street-level doses of heroin in Israel. Contact: Latent Fingerprint Laboratory, Division of Identification and Forensic Science (DIFS), Israel Police, National HQ, Jerusalem 91906, Israel.]

#### **Additional Reference of Possible Interest:**

1. Kemeny GJ. **Micro-ATR identification of forensic materials using the  $\mu$ MAX microscope accessory.** Spectroscopy 2006;Suppl.:22. [Editor's Note: A minor overview and review of the title accessory. Application is stated only as "unknown forensic materials." Contact: PIKE Technologies, Inc., Madison, WI 53719.]

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# Microgram

## *Bulletin*

**Published by:**

The Drug Enforcement Administration  
Office of Forensic Sciences  
Washington, DC 20537

The U.S. Attorney General has determined that the publication of this periodical is necessary in the transaction of the public business required by the Department of Justice. Information, instructions, and disclaimers are published in the January issues.

- APRIL 2007 -

**- INTELLIGENCE ALERT -**

### **ECSTASY TABLETS WITH GLITTER IN WINONA COUNTY, MINNESOTA**

The Minnesota Bureau of Criminal Apprehension Forensic Science Laboratory in St. Paul recently received two separate submissions of apparent Ecstasy tablets, both with a “waving man” logo and containing glitter, suspected MDMA (see Photos 1 and 2). The first submission consisted of one red/pink tablet and one purple tablet, while the second submission

consisted of 547 of the red/pink

tablets and 1533 of the purple tablets (weights and dimensions not taken for either set). The first set of tablets were seized in Winona County by the Winona Police Department, while the second set of tablets were also seized in Winona County, but by the Bureau of Criminal Apprehension (no further details concerning either seizure); Winona County is located in the southeastern part of the state, approximately 130 southeast of St. Paul. Analysis of the first set of tablets by GC/MS confirmed MDMA and caffeine in the red/pink tablet but only MDMA in the purple



**Photo 1**



**Photo 2**

tablet. Analysis of the second set of tablets by GC/MS confirmed MDMA (but no caffeine) in the red/pink tablets and again only MDMA in the purple tablets. Trace amounts of methamphetamine (not confirmed) were also indicated in both sets of tablets. None of the exhibits were quantitated, but the MDMA loadings were low to moderate based on their respective TICs. These were the first submissions of Ecstasy tablets containing glitter and with this logo type to the laboratory.

[Editor's Notes: According to the analyst, other than their colors these tablets were highly similar to those described in March 2007 issue of *Microgram Bulletin*. Those tablets were seized in Birmingham, Alabama, were yellow and green (5 tablets each color), and contained MDMA, nicotinamide, trace MDP2P, and trace methamphetamine. As previously commented, it is unknown what health effects the presence of glitter in these tablets would have on the users.]

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### **- INTELLIGENCE ALERT -**

#### **CAPSULES CONTAINING 2,5-DIMETHOXY-4-ETHYLPHENETHYLAMINE (2C-E) IN TULSA, OKLAHOMA**

The Tulsa Police Department Forensic Laboratory (Oklahoma) recently received a white plastic bottle, labeled "Nortesten," including 100 clear gelatin capsules (23 x 8 millimeters), each containing approximately 10 milligrams of white powder, that field-tested as an amphetamine-like compound (see Photo 3). The exhibits were seized by the Tulsa Police pursuant to a search warrant in Tulsa (no further details). Analysis by GC/MS and FTIR indicated 2,5-dimethoxy-4-ethylphenethylamine (2C-E; not confirmed due to the lack of an authenticated standard). The capsule material was not quantitated; however, the TIC indicated no other components. 2C-E is not currently scheduled under Oklahoma law. This was the first ever submission of 2C-E to the laboratory.



**Photo 3**

[Editor's Notes: An Internet search on Nortesten indicates that it is a "nutritional supplement" intended to boost testosterone levels - and that it has been discontinued by the manufacturer (MuscleTech). According to several websites, Nortesten is purported to contain 18 milligrams of norandrostenediol (19-nor-4-androsten-3,17-diol) and 18 milligrams of norandrostenedione (19-nor-4-androsten-3, 17-dione) per capsule, in a time-release formulation.]



**- INTELLIGENCE ALERT -**

**ECSTASY MIMIC TABLETS (CONTAINING 1-(3-CHLOROPHENYL)-  
PIPERAZINE (mCPP)) IN HAMMOND, INDIANA**

The Indiana State Police Lowell Regional Laboratory recently received a poly-drug submission, including marijuana, cocaine, dihydrocodeinone (hydrocodone), hydromorphone, and 11 pink tablets with white specks with a diamond/gemstone logo, suspected Ecstasy (see Photo 4). The exhibits were seized by the Hammond Police Department while executing a search warrant at a local residence. The tablets were 9 millimeters in diameter and 3 millimeters thick, and weighed approximately 280 milligrams each. Analysis by GC/MS and TLC, however, indicated 1-(3-chlorophenyl)-piperazine (*meta*-chlorophenylpiperazine, mCPP) as the major component and only trace MDMA. The tablets were not quantitated, but the mCPP loading was high based on the TIC. mCPP is not currently scheduled under Indiana law. This was the first submission of Ecstasy mimic tablets containing mCPP, and also the first submission of tablets with this logo type, to the laboratory.



**Photo 4**

\* \* \* \* \*

**- INTELLIGENCE ALERT -**

**ORTHO-METHOXYPHENYLPIPERAZINE (OMPP) IN SEABROOK, TEXAS**

The Pasadena Regional Crime Laboratory (Texas) recently received a two-exhibit submission including about 0.5 grams of cocaine and 0.8 grams of a compressed green material, similar in appearance to an animal food pellet, submitted as suspected to contain MDMA (see Photo 5). The exhibits were seized by the Seabrook Police Department, pursuant to a traffic stop in Seabrook. A preliminary screen of the second exhibit using ferricyanide indicated the presence of a secondary amine, but the color change was slower than would be expected for MDMA. All other spot tests (including Marquis) were negative (suggesting MDMA was not present). Analysis by GC/MS, FTIR, and UV indicated not MDMA but rather 1-(2-methoxyphenyl)-piperazine (OMPP; not confirmed due to the lack of an authenticated standard). The exhibit was not quantitated, but the OMPP loading was low based on the TIC. This was the laboratory's first encounter with a piperazine in any form.



**Photo 5**

**(Note: Scale is in Inches)**

**- INTELLIGENCE ALERT -**

**LIQUID LSD IN ANCHORAGE, ALASKA**

The State of Alaska, Scientific Crime Detection Laboratory, Anchorage recently received a blue, plastic, 50 milliliter bottle of “Skyy Vodka,” which was wrapped in plastic and Winnie the Pooh wrapping paper, that contained approximately 5 milliliters of yellow liquid with an odor of mint-flavored mouthwash, suspected to be a solution of methamphetamine (see Photo 6, showing the transferred solution). The exhibit was seized by the U.S. Postal Inspection Service at the Anchorage Postal facility (no further details). Analysis of the liquid by Ehrlich’s reagent, TLC, and GC/MS, however, indicated not methamphetamine but rather lysergic acid diethylamide (LSD; not quantitated). The liquid base was not identified. The exhibit was not quantitated, but the LSD loading was high based on the TIC. This is the first submission of liquid LSD to the laboratory.



**Photo 6**

\* \* \* \* \*

**- INTELLIGENCE ALERT -**

**BROWN COCAINE SMUGGLED IN A HAMMOCK CHAIR  
IN LOUISVILLE, KENTUCKY**

The Customs and Border Protection Laboratory at Chicago, Illinois recently received an exhibit of a dark brown, somewhat plastic material that had been concealed in the wooden bar of a hammock chair, submitted as a suspected controlled substance (see Photos 7 and 8). The hammock chair was seized by CBP Inspectors at a parcel service shipping hub in Louisville, Kentucky, and had been in transit from Venezuela to Spain (no further details). The substance (total net mass 592 grams) had an appearance similar to opium or black tar heroin, but did not field-test for any common controlled substance. Preliminary screening at the laboratory gave strong positive results with the Mayers and silver nitrate reagents. The sample also gave a red color with Scott’s reagent - but the color did not change or extract into chloroform. Analysis by FTIR, GC, GC/MS, and HPLC, however, indicated neither opium alkaloids or heroin but rather 49 percent cocaine hydrochloride, along with methyl benzoate and various other cocaine alkaloids. The cause for the dark brown coloration was not determined; however, the dark color and anomalous behavior with field and laboratory color tests suggests that the substance is a sample of so-called “black cocaine.” This is the first submission of black cocaine to the laboratory, and is also believed to be the first seizure of a hammock chair containing a controlled substance at the Louisville shipping hub; however, similar items have been encountered at other CBP facilities.



**Photo 7**

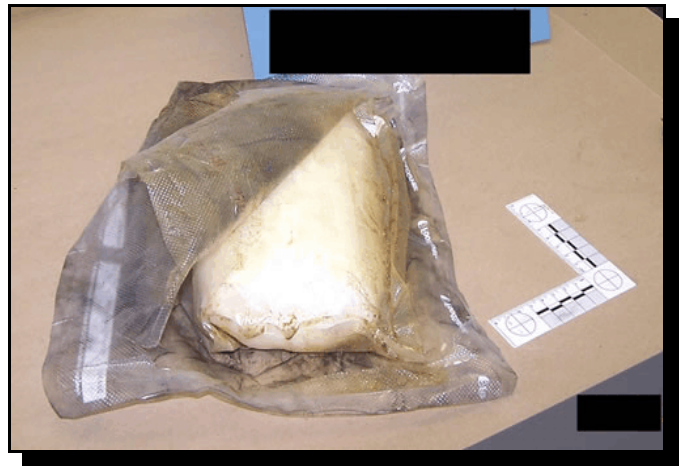


**Photo 8**

**- INTELLIGENCE ALERT -**

**FENTANYL IN BLYTHE, CALIFORNIA**

The DEA Southwest Laboratory (Vista, California) recently received two bricks of compressed white powder, suspected fentanyl (see Photo 9). The exhibits were seized in Blythe, California by the Riverside County Sheriff's Department Special Investigation Bureau-East (no further details). The exhibits were heavily packaged in layers of plastic vacuumed-sealed bags, grease, plastic wrap, and zip-lock plastic bags. Analysis of the powder (total net mass 1675 grams) by Marquis resulted in a slow-developing orange color (consistent with fentanyl). Further analysis by GC, FTIR, GC/MS, and LC confirmed 9.8 percent fentanyl hydrochloride, cut with lactose; a small amount of 4-anilino-N-phenethylpiperidine (ANPP) was also noted. This is the second such submission to the DEA Southwest Laboratory - a prior submission of 945.1 grams of 83 percent fentanyl hydrochloride was received in March, 2006. The Southwest Laboratory has also assisted in the investigation and seizure of two clandestine fentanyl manufacturing laboratories over the past three years.



**Photo 9**

**(Note: The Inside Legs of the Ruler are 8 cms)**

\* \* \* \* \*

**- INTELLIGENCE ALERT -**

**HEROIN-LACED BOLTS OF CLOTH AT THE EL PASO PORT OF ENTRY**

The DEA South Central Laboratory (Dallas, Texas) recently received five bolts of cotton cloth laced with a fine light tan powder, suspected heroin (see Photo 10). The exhibits were seized by Immigration and Customs Enforcement personnel from within the clothing of an individual who was entering at the El Paso Port-of-Entry. Analysis of the powder (total net mass 2.4 kilograms) by GC/MS, FTIR, and GC/FID confirmed 80.8 percent heroin hydrochloride. The South Central Laboratory has received similar submissions in the past, but they are not common.



**Photo 10**

\* \* \* \* \*



**- INTELLIGENCE ALERT -**

**AQUEOUS SOLUTIONS OF 4-CHLORO-2,5-DIMETHOXYAMPHETAMINE  
(DOC) IN TAMPA, FLORIDA**

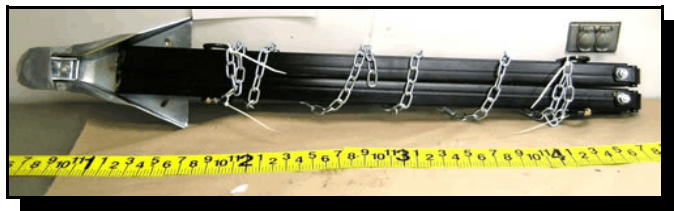
The DEA Southeast Laboratory (Miami, Florida) recently received eight small plastic squeeze bottles, of two different sizes, labelled as breath fresheners and containing small amounts of liquids, submitted as suspected liquid LSD (photos not available). The submissions were seized at a residence in Tampa, Florida by the Tampa Police, pursuant to a date-rape investigation. One of the subexhibits consisted of six squeeze bottles, each containing about 1.3 milliliters of a clear solution; the second subexhibit consisted of two slightly larger squeeze bottles, each containing about 0.25 milliliters of a pink solution. All eight solutions were aqueous and had pH values ranging from 3 - 5. Analysis by GC/FID, GC/MS, FTIR/ATR, and NMR, however, indicated not LSD but rather 4-chloro-2,5-dimethoxyamphetamine (DOC; salt form not determined and quantitation not performed) in seven of the eight bottles - one of the smaller bottles contained no controlled substances. This is the first submission of this type to the Southeast Laboratory.

\* \* \* \* \*

**- INTELLIGENCE ALERT -**

**HEROIN AND COCAINE SMUGGLED IN TRAILER HITCHES  
IN NEW MILFORD, CONNECTICUT**

The DEA Northeast Laboratory (New York, New York) recently received four trailer hitches and a heat-sealed evidence envelope containing a plastic bag, all containing white powders, suspected heroin (see Photos 11 and 12 for the hitches). The exhibits were seized in New Milford, Connecticut by Agents from the DEA New England Field Division (Bridgeport, CT) (no further details). Unusually, each hitch consisted of two square metal tubes connected by a metal hitch receiver/coupler, which were further wrapped with a metal chain. The hitches appeared to be functional. Each tube was internally lined with carbon paper, and contained a sleeve filled with white powder. The sleeves were clear plastic wrapped with brown, plastic tape. The ends of the tubes were closed with small metal caps that were epoxied in place. Preliminary screening of the removed powders, however, indicated either heroin or cocaine; 2 tubes contained heroin and 6 tubes contained cocaine. The bag of white powder (which had been removed by the perpetrators from other tubes at the



**Photo 11**



**Photo 12**

seizure site) contained heroin. Analysis of the heroin samples (total net mass 5.30 kilograms) by GC/FID, GC/MS, NMR, and FTIR/ATR confirmed 88 percent heroin hydrochloride and trace cocaine. Analysis of the cocaine samples (total net mass 10.55 kilograms) using the same analytical techniques confirmed 81 percent cocaine hydrochloride adulterated with diltiazem. This was the first submission of heroin or cocaine concealed in trailer hitches to the Northeast Laboratory. The origin of the hitches was not reported.

\* \* \* \* \*

## SELECTED REFERENCES

[Selected references are a compilation of recent publications of presumed interest to forensic chemists. Unless otherwise stated, all listed citations are published in English. Abbreviated mailing address information duplicates that provided by the abstracting service. Patents and Proceedings are reported only by their *Chemical Abstracts* citation number.]

1. Anastos N, Barnett NW, Pfeffer FM, Lewis SW. **Investigation into the temporal stability of aqueous standard solutions of psilocin and psilocybin using high performance liquid chromatography.** *Science & Justice* 2006;46(2):91. [Editor's Notes: Psilocin and psilocybin standards were used. The time frame was 14 days. Protection from light significantly prolonged the usefulness life of the standard solutions. Contact: School of Biological and Chemical Sciences, Deakin University, Geelong, VIC, 3217 Australia.]
2. Blackledge RD, Phelan CP. **Identification of bufotenine in Yopo seeds via GC/IRD.** *Microgram Journal* 2006;4(1-4):3. [Editor's Notes: The analysis of seeds from yopo (*Anadenanthera peregrina*) by GC/IRD and GC/MS is presented. The GC/IRD technique is easily able to discriminate between bufotenine (present in yopo seeds) and its positional isomer psilocin. Contact: U.S. Naval Criminal Investigative Service, Regional Forensic Laboratory - San Diego, 3405 Welles St., Suite 3, San Diego, CA 92136.]
3. Casale JF, Hays PA, Spratley TK, Smith PR. **The characterization of 4-methoxy-N-ethyl-amphetamine hydrochloride.** *Microgram Journal* 2006;4(1-4):42. [Editor's Notes: The synthesis, analysis, and characterization of 4-methoxy-N-ethylamphetamine hydrochloride is presented. Analytical data (GC/MS, FTIR, and <sup>1</sup>H-NMR) are presented. Contact: U.S. Department of Justice, Drug Enforcement Administration, Special Testing and Research Laboratory, 22624 Dulles Summit Court, Dulles, VA 20166.]
4. Casale JF, Piñero EL, Corbeil EM. **Isolation of cis-cinnamoylcocaine from crude illicit cocaine via alumina column chromatography.** *Microgram Journal* 2006;4(1-4):37. [Editor's Notes: A procedure for isolating gram quantities of reference quality *cis*-cinnamoylcocaine from crude cocaine base is presented. Isolation was achieved through classical alumina column chromatography and recrystallization. Contact: U.S. Department of Justice, Drug Enforcement Administration, Special Testing and Research Laboratory, 22624 Dulles Summit Court, Dulles, VA 20166.]
5. Chinaka S, Iio R, Takayama N, Kodama S, Hayakawa K. **Chiral capillary electrophoresis of amphetamine-type stimulants.** *Journal of Health Science* 2006;52(6):649. [Editor's Notes: A review (compounds not specified in the abstract). Contact: Forensic Sci. Lab., Ishikawa Prefectural Police Headquarters, Kanazawa, Japan 920-8553.]

6. Edwards NR. **Qualitative and quantitative analysis of Ionamin 30 capsules (containing a time-release formulation of phentermine).** Microgram Journal 2006;4(1-4):66. [Editor's Notes: Analysis of a time-release formulation of phentermine required sonication in water for 60 minutes, in order to release the active compound from the matrix. Contact: U.S. Department of Justice, Drug Enforcement Administration, Mid-Atlantic Laboratory, 1440 McCormick Dr., Largo, MD 20774.]
  
7. Eliasson C, Matousek P. **Noninvasive authentication of pharmaceutical products through packaging using spatially offset Raman spectroscopy.** Analytical Chemistry 2007;79(4):1696. [Editor's Notes: The title technique is beneficial in situations where the conventional Raman backscattering method is adversely affected by excessive surface Raman or fluorescence from the packaging, capsule shell, or tablet coating. Contact: Central Laser Facility, CCLRC Rutherford Appleton Laboratory, Didcot Oxfordshire OX11 0QX, UK.]
  
8. Franckowski RE, Thompson RA. **Eszopiclone (Lunesta™): An analytical profile.** Microgram Journal 2006;4(1-4):29. [Editor's Notes: Analytical data (GC, MS, IR, UPLC™, and <sup>1</sup>H- and <sup>13</sup>C-NMR) for eszopiclone are presented. Contact: U.S. Department of Justice, Drug Enforcement Administration, Special Testing and Research Laboratory, 22624 Dulles Summit Court, Dulles, VA 20166.]
  
9. Lu M, Shen J, Li N, Zhang Y, Zhang C, Liang L, Xu X. **Detection and identification of illicit drugs using terahertz imaging.** Journal of Applied Physics 2006;100(10):103104/1-103104/5. [Editor's Notes: The stated application was for pure drugs hidden in mail envelopes. Drugs determined included ketamine, MDMA, MDA, heroin, acetylcodeine, and morphine. Contact: Department of Physics, Capital Normal University, Beijing, Peop. Rep. China 100037.]
  
10. Petek MJ, Lucic Vrdoljak A. **Qualitative and quantitative gamma-hydroxybutyrate analysis.** Arhiv za Higijenu Rada I Toksikologiju 2006;57(4):397. [Editor's Notes: An overview and review. This article is written in Croatian. Contact: Centar za Kriminalistička Vjestacenja "Ivan Vucetic," Ministarstvo Unutarnjih Poslova, Zagreb, Croatia.]
  
11. Piñero EL, Casale JF. **Quantitation of cocaine by gas chromatography-flame ionization detection utilizing isopropylcocaine as a structurally related internal standard.** Microgram Journal 2006;4(1-4):47. [Editor's Notes: The quantitation of cocaine by GC/FID using isopropylcocaine as a structurally related internal standard is presented. The selectivity, precision, and accuracy of the method are detailed. The facile, multi-gram synthesis of isopropylcocaine standard from cocaine (via two different routes) is described. Contact: U.S. Department of Justice, Drug Enforcement Administration, Special Testing and Research Laboratory, 22624 Dulles Summit Court, Dulles, VA 20166.]
  
12. Sarwar M. **A new, highly specific color test for ketamine.** Microgram Journal 2006;4(1-4):24. [Editor's Notes: Treatment of ketamine with alkaline gold bromide produces a deep purple color within approximately one minute that changes to dark, blackish-purple within approximately two minutes. The color, color change, and time frames constitutes a highly specific screening test for ketamine. The test is negative for amphetamine, methamphetamine, MDA, MDMA, and PCP, all of which are occasionally encountered in combination with ketamine. Contact: Forensic Research Laboratory, Center for Excellence in Molecular Biology, University of the Punjab, Lahore, Pakistan.]
  
13. Tsujikawa K, Kanamori T, Kuwayama K, Miyaguchi H, Iwata Y, Inoue H. **Analytical profiles for 3,4,5-, 2,4,5-, and 2,4,6-trimethoxyamphetamine.** Microgram Journal 2006;4(1-4):12.



[Editor's Notes: Analytical profiles (Marquis color testing, IR, NMR, TLC, HPLC, and GC/MS) are presented for the three title TMAs. Contact: National Research Institute of Police Science, 6-3-1, Kashiwanoha, Kashiwa, Chiba 277-0882, Japan.]

14. Wisniewski ES, Hays PA. **Dehydrochlormethyltestosterone: An analytical profile.** *Microgram Journal* 2006;4(1-4):54. [Editor's Notes: Analytical data (GC, GC/MS, FTIR, HPLC, <sup>1</sup>H- and <sup>13</sup>C- NMR) for the analysis and identification of dehydrochlormethyltestosterone ((17β)-4-chloro-17-hydroxy-17-methylandrosta-1,4-dien-3-one) is presented. Historical background is also included. Contact: U.S. Department of Justice, Drug Enforcement Administration, Mid-Atlantic Laboratory, 1440 McCormick Dr., Largo, MD 20774.]
15. Zhang S-y, Huang Z-p. **A color test for rapid screening of gamma-hydroxybutyric acid (GHB) and gamma-butyrolactone (GBL) in drink and urine.** *Fayixue Zazhi* 2006;22(6):424. [Editor's Notes: GHB was converted to GBL, then reacted with hydroxylamine to form the hydroxamate. This was reacted with acidic ferric chloride to give a purple complex. The LoD was 0.5 - 2 mg/mL. This article is written in Chinese. Contact: Fujian Public Security Coll., Fuzhou 350007, Peop. Rep. China.]
16. Zhou X-y, Ma D, Bu J, Shen B-h. **Evaluation of uncertainty in determination of heroin by GC.** *Fayixue Zazhi* 2006;22(6):421. [Editor's Notes: The authors concluded that repeated measurements and the GC instrument were the major sources of uncertainty in determining heroin by GC. This article is written in Chinese. Contact: Inst. of Forensic Sci., Ministry of Justice, Shanghai 200063, Peop. Rep. China.]

#### Additional References of Possible Interest:

1. Bosserhoff A, Hellerbrand C. **Capillary electrophoresis.** *Molecular Diagnostics* 2005:67. [Editor's Notes: A review (unspecified "forensic science applications" are mentioned in the abstract. Contact: Institute of Pathology, University of Regensburg, Regensburg, Germany.)]
2. Kintz P. **Principles of drug-facilitated crime investigations.** *Spectra Biologie* 2006;25(156):42. [Editor's Notes: An overview. Focus is toxicology (analysis of biological fluids in cases). This article is written in French. Contact: Laboratoire ChemTox, Illkirch 67400, Fr.]

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## THE JOURNAL/TEXTBOOK COLLECTION EXCHANGE

The Journal/Textbook Collection Exchange is a service intended to facilitate the transfer of unwanted journals and textbooks to forensic libraries or other *Microgram* subscribers. At present, this service is offered once a quarter (in January, April, July, and October). There were no donations offered during the past quarter.

**All subscribers are encouraged to donate surplus or unwanted items/collections.** Reference texts and long runs of forensic/analytical journals are of particular interest; however, even single issues are worthwhile. If interested, please consult the *Microgram* website or contact the *Microgram* Editor for further instructions.

The next offering of journals and textbooks will be in the July 2007 issue of *Microgram Bulletin*.

## THE DEA FY 2007 STATE AND LOCAL FORENSIC CHEMISTS SEMINAR SCHEDULE

The remaining FY - 2007 schedule for the DEA's State and Local Forensic Chemists Seminar is as follows:

July 9 - 13, 2007  
September 10 - 14, 2007

Note that the school is open only to forensic chemists working for law enforcement agencies, and is intended for chemists who have completed their agency's internal training program and have also been working on the bench for at least one year. There is no tuition charge for this course. The course is held at the AmeriSuites Hotel in Sterling, Virginia (near the Washington/Dulles International Airport). A copy of the application form is reproduced on the last page of the August 2004 issue of *Microgram Bulletin*. Completed applications should be mailed to the Special Testing and Research Laboratory (Attention: J. Kerlavage) at: 22624 Dulles Summit Court, Dulles, VA 20166. For additional information, call 703/668-3337.

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### EMPLOYMENT OPPORTUNITIES

Position: **Forensic Scientist (Chemist)** (First Posting)  
Location: Montana Forensic Science Division; Missoula, Montana  
Salary: \$42,931.00 to \$53,664.00  
Application Deadline: July 15, 2007 (Faxed applications will not be accepted)

Duties and Responsibilities: Independently analyze evidence to identify controlled substances utilizing scientific testing procedures. Perform analyses of chemicals seized in clandestine laboratories to determine methods of manufacture and products produced. Identify adulterants, poisons, and discrepancies in product formulations related to product tampering investigation. Maintain accurate chain of custody records on evidence examined. Prepare written reports, including documentation of analyses performed and final conclusions. Provide expert testimony in courts of law. Experienced in maintaining scientific equipment, including quality control documentation. Provide instruction to law enforcement officers regarding evidence collection and preservation. Review casework for accuracy and adherence to standard operating procedures. The ideal applicant will also be proficient in the application of ASTM methods used in the analysis of fire debris. Performs other duties as assigned.

Qualifications: A minimum of a B.S. in Chemistry or related field with 3 years experience in a forensic laboratory specializing in the analysis of controlled substances. A additional experience in the analysis of fire debris is preferred.

Contact: Jim Hutchison  
Chemical Analysis Supervisor  
Montana Forensic Science Division  
[jhutchison-at-mt.gov](mailto:jhutchison-at-mt.gov)  
(406) 329-1114

Applications may be obtained at: <http://mt.gov/statejobs/statejobs.asp>

### **“How Much is Enough?”**

This is probably the most frequently asked question in computer forensic programs. Examiners and laboratory managers are constantly juggling increasing numbers of cases and “priority” examinations every year. Compounding the numbers crunch are the concurrent increases in the storage capacity and technical complexity of today’s digital devices. With few exceptions, all cases are “priority” and no cases are “routine.” A related issue is the “Scope of the Investigation.” Computer forensic examiners have to stay within the scope of the investigation/warrant, or they risk tainting the evidence or spending excessive amounts of time on useless tangents. In short, complex cases require an intelligent, targeted approach to extract the relevant information in a reasonable time-frame.

### **“What Information is Needed?”**

This is probably the most important question before collecting or analyzing digital evidence (and answers the question of “How Much is Enough?”) In many investigations, the case agents/investigators do not know in advance if or how the information the computer forensic examiner will provide will assist them. In some cases, the case agent/investigator may already have sufficient evidence in order to successfully prosecute the case, and so the computer forensic examination is an afterthought, or a “fishing expedition,” or is declined altogether as “not needed.” However, digital evidence can both corroborate information already obtained during an investigation and identify new leads and/or new co-conspirators. In addition, the information can assist plea bargaining and/or can impact sentencing.

### **Technical Challenges**

As noted above, case complexity is ever increasing. A common example are cases geared towards dismantling Internet-based pharmacy and Internet-based money laundering organizations. In many such cases, the digital evidence may contain huge, complex databases, extensive email communications, and large amounts of financial information. In addition, the data may be stored on new generation storage devices, or in proprietary formats, or encrypted. These are significant challenges even for experienced examiners.

Also as noted above, storage capacities are also ever increasing. Hard drives are now reaching 750 gigabytes, and will soon reach and surpass 1 terabyte. RAID servers (commonly used by businesses and web host companies) can store 40 terabytes or more. Extracting the pertinent information from such large volumes of data can be a daunting challenge.

### **The Answer - Communication and Cooperation**

Information exchange between the case agent/investigator and the computer forensic examiner is crucial to identify the information relevant to the case, minimize the examination time needed to extract it, and stay within the scope of the warrant and investigation. Establishing a close working relationship will result in faster (and maximum value) results for the case agents/investigators and reduced backlogs for the digital evidence laboratories - a win/win situation.

Questions or comments? E-mail: [Walter.Aponte -at- usdoj.gov](mailto:Walter.Aponte-usdoj.gov)

\* \* \* \* \*

# Microgram

## *Bulletin*

**Published by:**

The Drug Enforcement Administration  
Office of Forensic Sciences  
Washington, DC 20537

The U.S. Attorney General has determined that the publication of this periodical is necessary in the transaction of the public business required by the Department of Justice. Information, instructions, and disclaimers are published in the January issues.

- MAY 2007 -

**- INTELLIGENCE ALERT -**

### **INSOLE-SHAPED HEROIN BRICKS IN OKLAHOMA CITY**

The Oklahoma State Bureau of Investigation Northeast Regional Laboratory (Tahlequah) recently received two pairs of shoe-sole shaped bricks containing a compressed white powder, suspected heroin (see Photo 1). The exhibits were seized from an individual in Oklahoma City by the Oklahoma City Police, pursuant to a consent search. The bricks had been inserted in place of the insoles in the suspect's shoes. Each brick was wrapped with layers of brown tape, plastic, and grease, then covered with carbon paper. Analysis of the powder (total net mass 2195 grams) by GC and GC/MS confirmed heroin (quantitation not performed). Since this initial submission, additional exhibits totalling 4.1 kilograms have been received by the laboratory.



**Photo 1**

[Editor's Notes: According to the officer in this case, these soles were first noted around the first

of the year, and are still being encountered. The couriers are low-level “mules” believed to be in transit from the southwest border to New York City, are usually travelling by bus, and are wearing a variety of oversized footwear.]

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**- INTELLIGENCE ALERT -**

**ECSTASY COMBINATION TABLETS (CONTAINING KETAMINE, PROCAINE,  
AND MDMA) IN HUNTINGTON BEACH, CALIFORNIA**

The Huntington Beach Police Department Crime Laboratory (California) recently received 12 round blue tablets with a “7” logo, suspected “Ecstasy” (see Photo 2). The exhibits were seized in Huntington Beach pursuant to a traffic stop for suspected impaired driving (marijuana was also seized). The tablets were 8 millimeters in diameter by 4.5 millimeters thick, and weighed 280 milligrams each. Analysis by color testing, FTIR/ATR, and GC/MS indicated ketamine, procaine, and MDMA in an approximate 53:37:10 ratio (not formally quantitated). This was the first known submission of Ecstasy tablets containing this particular combination to the laboratory.



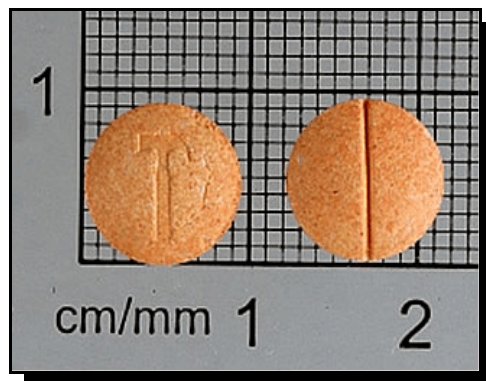
**Photo 2**

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**- INTELLIGENCE ALERT -**

**ECSTASY COMBINATION TABLETS (CONTAINING MDMA AND PROCAINE)  
IN WYOMING COUNTY, NEW YORK**

The Monroe County Public Safety Laboratory (Rochester, New York) recently received four round, orange tablets with a “claw hammer” logo on one face and half-scored on the reverse face, apparent Ecstasy (see Photo 3). The tablets were seized in Wyoming County, New York (details sensitive). The tablets were 9.2 millimeters in diameter by 5 millimeters thick, and weighed approximately 325 milligrams each. Unlike almost all purported “Ecstasy” tablets submitted to the laboratory, which are barrel shaped with flat tops and bottoms, these were biconvex. Analysis by nitroprusside, Marquis, and GC/MS confirmed MDMA, adulterated with procaine (not quantitated, but with similar abundances based on their TICs). This was the first submission of Ecstasy tablets with this logo to the laboratory.



**Photo 3**



**- INTELLIGENCE ALERT -**

**COCAINE IN A HARD RUBBER-LIKE MATRIX IN TULUA, COLOMBIA**

The DEA Special Testing and Research Laboratory (Dulles, Virginia) recently received a Ziploc bag imprinted with a puzzle piece and containing a piece of hard, black rubber-like material, suspected to contain heroin (see Photo 4). The exhibit (total net mass 9.2 grams) was a small exemplar taken from an 85 kilogram shipment of this material that was seized in Tulua, Colombia by the Colombian National Police Heroin Task Force. Analysis of chloroform and 9:1 chloroform/methanol extracts by GC/FID, GC/MS and FTIR/ATR, however, indicated not heroin but rather 47.6 percent cocaine hydrochloride. Further analysis by GC/FID, GC/ECD and SHS-GC/MS indicated that the cocaine was probably produced from *Erythroxylum novogranatense* var. *truxillense*, a species of coca that is only cultivated in Colombia. The composition of the rubber-like matrix was not determined, and the method for incorporating the cocaine in this matrix is unknown. The Special Testing and Research Laboratory has previously received controlled substances in various synthetic matrices, but this was the first submission of this specific type. It was not reported what the material was supposed to imitate.



**Photo 4**

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**- INTELLIGENCE ALERT -**

**COCAINE SMUGGLED IN A WOODEN STAND AT DULLES INTERNATIONAL AIRPORT, VIRGINIA**

The DEA Mid-Atlantic Laboratory (Largo, Maryland) recently received a decorative wooden stand containing four plastic-wrapped packages of compressed white powder in a hollowed-out section, that field-tested positive for cocaine (see Photo 5; note that stand was approximately 8 x 8 x 16 inches). The exhibit originated in Mexico City and was seized at the Dulles International Airport by U.S. Customs and Border Protection personnel (details sensitive). Analysis of the white powder (total net mass 3.975 kilograms) with GC, GC/MS, and FTIR confirmed 74.4 percent cocaine hydrochloride. Although the Mid-Atlantic Laboratory routinely receives controlled substances secreted in wooden consumer items, this is the first known submission utilizing a stand of this type.



**Photo 5**



**- INTELLIGENCE ALERT -**

**COCAINE MIMIC BRICKS (CONTAINING LIDOCAINE AND MANNITOL)  
IN CHICAGO, ILLINOIS**

The DEA North Central Laboratory (Chicago, Illinois) recently received 98 bricks of two different types, all containing white powder, suspected cocaine. The physical appearance of 93 bricks were typical of kilogram cocaine bricks. However, the remaining 5 bricks were larger, more loosely packed, more spherically shaped, and minimally packaged in plastic bags and brown tape (see Photo 6). The exhibits were seized by DEA agents in Chicago pursuant to a consent search (no further details). Analysis of the powder in the lot of 93 bricks (total net mass 93.3 kilograms) by GC/MS, IR and GC/FID confirmed 83 percent cocaine hydrochloride, adulterated with hydroxyzine. However, analysis of the powder in the lot of 5 bricks (total net mass approximately 10.5 kilograms) by the same techniques indicated only lidocaine and mannitol, in about a 1:3 ratio. This was the first submission of lidocaine/mannitol “bricks” to the North Central Laboratory in recent memory.



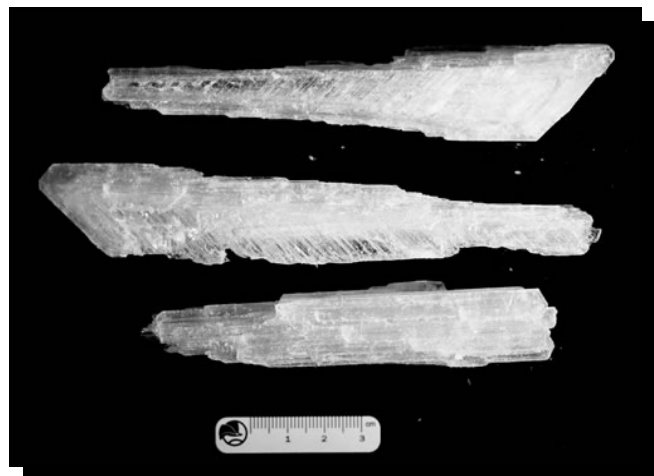
**Photo 6**

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**- INTELLIGENCE ALERT -**

**UNUSUAL APPEARING ICE METHAMPHETAMINE  
IN PITTSBURG, CALIFORNIA**

The DEA Western Laboratory (San Francisco, California) recently received a seizure of 20 plastic bags, each containing very large, white crystals, suspected “Ice” methamphetamine (see Photo 7). The exhibits were seized in Pittsburg, California by DEA and ATF agents as a result of a buy/bust operation. Unusually, the crystals (total net mass 9.023 kilograms) averaged about 3 inches long. Analysis by Marquis, FTIR, and GC/FID confirmed 96 percent d-methamphetamine hydrochloride. This is the first such submission to the DEA Western Laboratory.



**Photo 7**

## SELECTED REFERENCES

[Selected references are a compilation of recent publications of presumed interest to forensic chemists. Unless otherwise stated, all listed citations are published in English. Abbreviated mailing address information duplicates that provided by the abstracting service. Patents and Proceedings are reported only by their *Chemical Abstracts* citation number.]

1. Barker WD, Antia U. **A study of the use of Ephedra in the manufacture of methamphetamine.** *Forensic Science International* 2007;166(2-3):102. [Editor's Notes: Ephedra was reduced by four different methods (not specified in the abstract), and the products, byproducts, and intermediates of each route were identified. Contact: Institute of Environmental Science and Research Ltd (ESR), Mt Albert Research Centre, Hampstead Road, Private Bag, Auckland 92021, N.Z.]
2. Culshaw PN. **Electrochemical reduction of pseudoephedrine to methylamphetamine.** *Journal of the Clandestine Laboratory Investigating Chemists Association* 2007;17(2):5. [Editor's Notes: Presents the title study (details withheld in accordance with Microgram policy). JCLICA is law enforcement restricted. Contact: Forensic Chemistry, Queensland Health Scientific Services, 39 Kessels Road, Coopers Plains, QLD 4108, Australia.]
3. Fierro I, Deban L, Pardo R, Tascon M, Vazquez D. **Determination of mercury and arsenic in ecstasy tablets by electrochemical methods.** *Forensic Toxicology* 2006;24(2):70. [Editor's Notes: Mercury was determined with Differential Pulse Anodic Stripping Voltametry with a rotating gold electrode, and arsenic with Cathodic Stripping Voltametry in the Differential Pulse Mode with a hanging mercury drop electrode. Nine samples (all seized in Spain) were analyzed. The techniques were felt to be potentially useful for impurity profiling. Contact: Departamento de Quimica Analitica, Facultad de Ciencias, Universidad de Valladolid, Valladolid 470005, Spain.]
4. Kato N, Kojima T, Yoshiyagawa S, Ohta H, Toriba A, Nishimura H, Hayakawa K. **Rapid and sensitive determination of tryptophan, serotonin, and psychoactive tryptamines by thin-layer chromatography/fluorescence detection.** *Journal of Chromatography, A* 2007;1145(1-2):229. [Editor's Notes: The compounds were detected by UV (365 nm) after being sprayed with various reagents; the tryptamines were not identified in the abstract. Contact: Kanagawa Prefectural Police Headquarters, Scientific Crime Laboratory, 155-1 Yamashita-cho, Naka-ku, Yokohama, Kanagawa 231-0023, Japan.]
5. Kuila DK, Lahiri SC. **Search for suitable mobile phase in TLC analysis of different drugs of forensic interest and their gas liquid chromatographic experiment.** *Journal of the Indian Chemical Society* 2007;84(1):69. [Editor's Notes: The materials/compounds that were tested included cannabis, opium, cocaine, and methaqualone. Contact: Central Forensic Science Laboratory, Kolkata 700 014, India.]
6. Mantie KG. **Marihuana "Budder."** *Journal of the Clandestine Laboratory Investigating Chemists Association* 2007;17(2):4. [Editor's Notes: Discusses seizures of the title product, which appears to be a purified, concentrated marijuana extract with a very high THC content. This material is being widely encountered concealed in mailed letters in Canada, and appears to originate in the Vancouver area. JCLICA is law enforcement restricted. Contact: Steinbach RCMP Detachment, i/c Sprague Community Office (no further addressing information was provided).]

#### Additional References of Possible Interest:

1. Cruces-Blanco C, Gamiz-Gracia L, Garcia-Campana AM. **Applications of capillary electrophoresis in forensic analytical chemistry.** TrAC, Trends in Analytical Chemistry 2007;26(3):215. [Editor's Notes: A review, focusing on explosives and gunshot residues. Contact: Department of Analytical Chemistry, Faculty of Sciences, University of Granada, Granada 18071, Spain.]
2. Dubois J, Wolff J-C, Warrack JK, Schoppelrei J, Lewis EN. **NIR chemical imaging for counterfeit pharmaceutical products analysis.** Spectroscopy 2007;22(2):40. [Editor's Notes: Presents the title study. The technique allows for rapid screening of pharmaceutical and/or suspect products. Contact: Malvern Instruments, Analytical Imaging in Columbia, MD (zip code not provided).]
3. Forrester MB. **Oxycodone abuse in Texas, 1998-2004.** Journal of Toxicology and Environmental Health, Part A 2007;70(6):534. [Editor's Notes: An overview, based on calls to Texas poison control centers. Contact: Texas Department of State Health Services, Austin, TX (zip code not provided).]
4. Lin D-L, Liu H-C, Yin H-L. **Case report: Paramethoxymethamphetamine (PMMA) deaths in Taiwan.** Journal of Analytical Toxicology 2007;31(2):109. [Editor's Notes: A review of 8 cases. Contact: Institute of Forensic Medicine, Ministry of Justice, Taipei, Taiwan.]
5. Lund HS, Hemmersbach P. **Nandralone, a drug of abuse with many aspects.** Kjemi 2006;66(3):3. [Editor's Notes: A review, focusing on biochemistry and physiology. This article is written in Norwegian. Contact: Horman Laboratoriet, Aker Universitetssykehus, Uio, Norway.]
6. Maurin JK, Plucinski F, Mazurek AP, Fijalek Z. **The usefulness of simple X-ray powder diffraction analysis for counterfeit control - The Viagra example.** Journal of Pharmaceutical and Biomedical Analysis 2007;43(4):1514. [Editor's Notes: The technique allows for rapid screening of pharmaceutical and/or suspect tablets. Contact: The National Drug Institute, Chelmska 30/34, Warsaw 00-725, Pol.]
7. Porter SEG, Stoll DR, Paek C, Rutan SC, Carr PW. **Fast gradient elution reversed-phase liquid chromatography with diode-array detection as a high throughput screening method for drugs of abuse.** Journal of Chromatography, A 2006;1137(2):163. [Editor's Notes: Part II of: Stoll DR, Paek C, Carr PW. **Fast gradient elution reversed-phase high-performance liquid chromatography with diode-array detection as a high-throughput screening method for drugs of abuse.** Journal of Chromatography, A 2006;1137(2):153. This article presents the use of the chemometric method of target factor analysis to the chromatograms. Contact: Department of Chemistry, Virginia Commonwealth University, Richmond, VA 23294.]
8. Stoll DR, Paek C, Carr PW. **Fast gradient elution reversed-phase high-performance liquid chromatography with diode-array detection as a high-throughput screening method for drugs of abuse.** Journal of Chromatography, A 2006;1137(2):153. [Editor's Notes: Focus is biological samples. Contact: Department of Chemistry, Smith and Kolthoff Halls, University of Minnesota, Minneapolis, MN 55455.]
9. Van Nimmen NFJ, Poels KLC, Veulemans HAF. **Identification of exposure pathways for opioid narcotic analgesics in pharmaceutical production workers.** Annals of Occupational

Hygiene 2006;50(7):665. [Editor's Notes: Focus was on exposure to fentanyl. Contact: Laboratory for Occupational Hygiene and Toxicology, Department of Occupational, Environmental, and Insurance Medicine, Katholieke Universiteit Leuven, B-3000 Louvain, Belg.]

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## SCIENTIFIC MEETINGS

**1. Title: 33rd Annual NEAFS Meeting** (First Bimonthly Posting)  
**Sponsoring Organization:** Northeastern Association of Forensic Sciences  
**Inclusive Dates:** October 31 - November 3, 2007  
**Location:** Sagamore Resort (Bolton Landing, New York)  
**Contact Information:** Adrian S. Krawczeniuk ([Adrian.S.Krawczeniuk-at-usdoj.gov](mailto:Adrian.S.Krawczeniuk-at-usdoj.gov); 212/620-4923)  
**Website:** [www.neafs.org](http://www.neafs.org)

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## EMPLOYMENT OPPORTUNITIES

**Position: Forensic Scientist (Chemist)** (Second Posting)  
**Location:** Montana Forensic Science Division; Missoula, Montana  
**Salary:** \$42,931.00 to \$53,664.00  
**Application Deadline:** July 15, 2007 (Faxed applications will not be accepted)

**Duties and Responsibilities:** Independently analyze evidence to identify controlled substances utilizing scientific testing procedures. Perform analyses of chemicals seized in clandestine laboratories to determine methods of manufacture and products produced. Identify adulterants, poisons, and discrepancies in product formulations related to product tampering investigation. Maintain accurate chain of custody records on evidence examined. Prepare written reports, including documentation of analyses performed and final conclusions. Provide expert testimony in courts of law. Experienced in maintaining scientific equipment, including quality control documentation. Provide instruction to law enforcement officers regarding evidence collection and preservation. Review casework for accuracy and adherence to standard operating procedures. The ideal applicant will also be proficient in the application of ASTM methods used in the analysis of fire debris. Performs other duties as assigned.

**Qualifications:** A minimum of a B.S. in Chemistry or related field with 3 years experience in a forensic laboratory specializing in the analysis of controlled substances. Additional experience in the analysis of fire debris is preferred.

**Contact:** Jim Hutchison  
Chemical Analysis Supervisor  
Montana Forensic Science Division  
[jhutchison-at-mt.gov](mailto:jhutchison-at-mt.gov)  
(406) 329-1114

Applications may be obtained at <http://mt.gov/statejobs/statejobs.asp>

\* \* \* \* \*

Sometimes the technology fails.

It all started one week before Christmas when a case was assigned to me for analysis - recovering overwritten data on a 250 Gigabyte external hard drive. I was excited because I hadn't done a complete forensic examination since I became a supervisor. I have to take an annual proficiency test, but it's not the same as a "real" case.

Upon my initial evaluation, I saw that all of the data was located in the unallocated free space on the drive. This meant that I had to carve the data out.

With the assistance of a computer forensics examiner, the header information was obtained, which included the date stamp and the video header. I proceeded to perform the forensics analysis with this valuable information. Initially, I carved the data manually. This meant that I had to hold down the Shift and Page Down keys to highlight two-megabyte segments of data, one at a time, and then export it out to a folder located on another forensic hard drive. This process sounds easy - but it wasn't, because a video clip is a huge file. I did this for 2 weeks. Trust me, it quickly became tedious, and eventually painful.

After two weeks of this, I used the software that would repair the recovered data files (that is, convert it back into the original video). This was the highlight of all the work, and the results were seemingly worth the wait: "Hey, I can see some video!" That was a good feeling.

This continued for another week, and the good feelings faded. There had to be a better way. I then tried one of the validated forensic tools that we have in the laboratory, one that would "automatically" carve out the data for me. The results were astonishing - and disappointing. The tool quickly created 49 folders, each containing 400 carved data files. No more holding down the Shift and Page Down keys! But then, the repair tool was unable to do anything with the carved files. So I used a different carving tool - same results. The tools seemed to do what they were supposed to do, but the repair software couldn't do anything with the data.

I continued carving manually for two months. And after all this time, I was amazed to find that I had recovered only a few seconds of video.

The moral of this article is sometimes the technology fails, and the conventional way is the only way that will work, even though it may take you an extraordinary amount of time to get to the final result.

Questions or comments? E-mail: [Steven.L.Carter-usdoj.gov](mailto:Steven.L.Carter-usdoj.gov)

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# Microgram

## *Bulletin*

**Published by:**

The Drug Enforcement Administration  
Office of Forensic Sciences  
Washington, DC 20537

The U.S. Attorney General has determined that the publication of this periodical is necessary in the transaction of the public business required by the Department of Justice. Information, instructions, and disclaimers are published in the January issues.

- JUNE 2007 -

**- INTELLIGENCE ALERT -**

### **ECSTASY TABLETS WITH GLITTER IN HOWARD COUNTY, MARYLAND**

The Maryland State Police Forensic Sciences Division Laboratory (Pikesville, Maryland) recently received two separate submissions of green tablets containing glitter with a “Waving Man” logo, suspected Ecstasy (see Photo 1). The first submission consisted of 30 tablets (total net mass 8.1 grams), and were part of a polydrug seizure made by the Howard County Police from a individual in West Columbia. The second submission consisted of 10 tablets (total net mass 2.7 grams), and were part of a polydrug seizure also made by the Howard County Police, pursuant to a search and seizure warrant for suspected illicit drug activity at an apartment also in West Columbia. All of the tablets were well formed and did not crumble during handling. Analysis using a combination of color testing, FTIR/ATR, GC, and/or GC/MS confirmed MDMA, along with a small amount of niacinamide and trace methamphetamine (not confirmed). The MDMA was not quantitated but appeared to be above average based on the chromatograms and TICs. Other than minor variations in the percentages and relative ratios of the MDMA, niacinamide,



**Photo 1**



and methamphetamine, the two sets of tablets were nearly identical in both appearance and chemical makeup. These are the first submissions of Ecstasy tablets containing glitter to the laboratory. No additional seizures of these tablets have been reported since these two submissions.

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**- INTELLIGENCE ALERT -**

**PHENTERMINE COUNTERFEITS (CONTAINING ACETAMINOPHEN)  
IN PASADENA, TEXAS**

The Pasadena Regional Crime Laboratory (Texas) recently received a submission of approximately 100 oval white tablets with blue speckles, each imprinted with “A 159” and half-scored on one face (see Photo 2; scale tick-marks are 1/8th inch). The tablets were turned into the Pasadena Police by a private citizen who had found them in their child’s rucksack. The tablet packaging was not included, but allegedly indicated that the tablets had been produced in and shipped from Pakistan, apparently filling an order made on an Internet website. An Internet search indicated that the tablet type and imprint were consistent with a pharmaceutical phentermine product. However, although most of the tablets appeared to be in good condition, a number of fragments and powder from broken tablets was noted, and subsequent handling showed that the tablets were not properly compressed and crumbled easily, suggesting that the tablets were not a legitimate pharmaceutical product. Analysis of the tablets (weight not determined) by UV and GC/MS indicated not phentermine but rather only acetaminophen. This submission is this laboratory’s first encounter with counterfeit phentermine tablets.



**Photo 2**

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**- INTELLIGENCE ALERT -**

**HEROIN PELLETS SMUGGLED FROM ECUADOR INSIDE COOKIE PACKAGES  
AT NEWARK INTERNATIONAL AIRPORT**

The DEA Northeast Laboratory (New York, New York) recently received 12 large packages of chocolate wafer-style cookies, each containing 6 smaller sleeve packages, most containing 7 pellets of a tan colored, compressed powder, suspected heroin (see Photos 3 and 4, next page). The exhibits were seized by Immigration and Customs Enforcement personnel from the luggage of a passenger arriving at Newark Liberty International Airport (New Jersey) on a flight from Guayaquil, Ecuador. The pellets appeared to be quite similar to those typically recovered from “swallows,” and were 1 1/2 x 5/8 inches and wrapped in a combination of wax paper and clear plastic. Analysis of the powder (total net mass 4.19 kilograms in 500 pellets) by color

testing, GC/FID, GC/MS, and FTIR/ATR confirmed 70 percent heroin hydrochloride, adulterated with caffeine. The Northeast Laboratory routinely receives heroin concealed in various types of containers and packaging, including within candies and inside candy wrappers.



Photo 3



Photo 4

\* \* \* \* \*

#### - INTELLIGENCE ALERT -

### VERY LARGE BLACK TAR HEROIN SEIZURE IN ANAHEIM, CALIFORNIA

The DEA Southwest Laboratory (Vista, California) recently received 8 large packages containing dark brown materials, suspected black tar heroin. The packages were marked with either a smiling sunshine logo or the word "Mayey," and were wrapped either in brown tape or cellophane and carbon paper (see Photos 5 and 6). The exhibits were part of a polydrug seizure made by Immigration and Customs Enforcement at a residence in Anaheim; in addition to more packages of the brown powder, about 15 kilograms of marijuana, 1.5 kilograms of dimethylsulfone, and sodium hydroxide were also seized. Analysis of the material (total net mass in the 8 submitted exhibits 31.82 kilograms) by FTIR/ATR, GC/FID, and GC/MSD confirmed heroin (calculated as the hydrochloride) varying from 5.2 - 12.7 percent, with most bricks also containing large amounts of noscapine (not quantitated). This was one of the largest ever seizures of black tar heroin in California history.

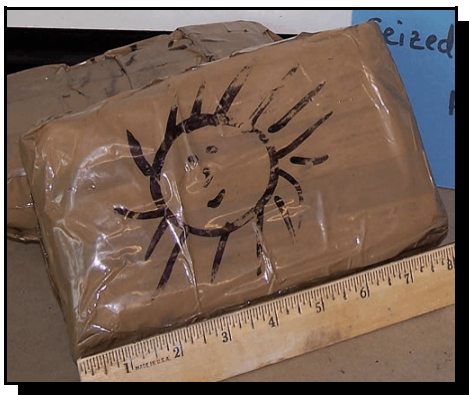


Photo 5



Photo 6

**- INTELLIGENCE ALERT -**

**KHAT IN DECATUR, GEORGIA**

The DEA Southeast Laboratory (Miami, Florida) recently received a cardboard box containing 96 bundles of decomposing plant material, wrapped in banana leaves and layers of newspaper, apparent khat (see Photo 7). The exhibit was seized by agents from the DEA/Atlanta Field Division at a commercial carrier facility in Decatur, Georgia. Analysis of the leaves (total net mass 8,671 grams) by GC/MS confirmed cathinone (not quantitated). This was the first khat submission to the Southeast Laboratory in several years. Approximately one month after this first submission a second exhibit containing 71 bundles of similar material was seized at the same commercial carrier facility, and was also identified as khat (total net mass 5,545 grams; not quantitated). The shipping origin(s) for the exhibits was not reported. The last submission of khat to the Southeast Laboratory was in 1997.



**Photo 7**

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**- INTELLIGENCE BRIEF -**

**FOLLOWUP: “CHEESE” (HEROIN ADULTERATED WITH DIPHENHYDRAMINE AND ACETAMINOPHEN) CONTINUING IN DALLAS, TEXAS**

In the May, 2006 issue of Microgram Bulletin, a Special Intelligence Brief reported on the phenomenon of “Cheese,” a so-called “starter form” of heroin that is popular primarily among Hispanic youth in the Dallas Independent School District (DISD). At that time, analyses of “Cheese” samples showed that it contained acetaminophen, diphenhydramine hydrochloride, and up to 8 percent heroin. It is now well established that “Cheese” is manufactured by mixing a small quantity of heroin (probably black tar heroin) with a large quantity of crushed Tylenol-PM® caplets (that is, an Over-the-Counter formulation of acetaminophen and diphenhydramine hydrochloride marketed as a sleep aid).



**Photo 8**

Over the past year, “Cheese” has gained additional notoriety, with approximately 2 dozen major articles published in the mainstream media concerning its use. The DEA South Central Laboratory (Dallas, Texas) has recently analyzed numerous samples of “Cheese” provided by the DISD Police, using FTIR, GC/FID, and GC/MS (see Photo 8).

The qualitative results for 15 such samples submitted to the laboratory in March 2007, are reported below.

Received	Analyzed	Results
3/19/2007	3/19/2007	Heroin, Acetaminophen, Diphenhydramine
3/19/2007	3/19/2007	Heroin, Acetaminophen, Diphenhydramine
3/19/2007	3/19/2007	Heroin, Acetaminophen, Diphenhydramine
3/19/2007	3/19/2007	Heroin, Acetaminophen, Diphenhydramine
3/19/2007	3/19/2007	Heroin, Acetaminophen, Diphenhydramine
3/19/2007	3/20/2007	6-Monoacetylmorphine, Acetaminophen, Diphenhydramine
3/19/2007	3/20/2007	6-Monoacetylmorphine, Acetaminophen, Diphenhydramine
3/19/2007	3/20/2007	Heroin, Acetaminophen, Diphenhydramine
3/21/2007	3/21/2007	Heroin, Acetaminophen, Diphenhydramine
3/30/2007	4/2/2007	Heroin, Methamphetamine, Acetaminophen, Diphenhydramine
3/30/2007	4/2/2007	Heroin, Diphenhydramine, Acetaminophen
3/30/2007	4/3/2007	Heroin
3/30/2007	4/3/2007	Heroin, Acetaminophen, Diphenhydramine
3/30/2007	4/3/2007	No Detectable Controlled Substances
3/30/2007	4/3/2007	Methamphetamine, Heroin, Acetaminophen, Diphenhydramine

Of the 15 samples, 9 appeared to meet the classic definition of "Cheese." One sample contained only heroin, two contained 6-monoacetylmorphine instead of heroin (probably resulting from the decomposition of heroin in the original "Cheese" sample), two appeared to be "Cheese" that also contained a small amount of methamphetamine, and one had no controlled substances. The average heroin quant for these samples (calculated as the hydrochloride) was 2.0 percent.

\* \* \* \* \*

## SELECTED REFERENCES

[Selected references are a compilation of recent publications of presumed interest to forensic chemists. Unless otherwise stated, all listed citations are published in English. Abbreviated mailing address information duplicates that provided by the abstracting service. Patents and Proceedings are reported only by their *Chemical Abstracts* citation number.]

1. Baer I, Gurny R, Margot P. **NIR analysis of cellulose and lactose - Application to ecstasy tablet analysis.** *Forensic Science International* 2007;167(2-3):234. [Editor's Notes: Presents the title technique. Appears to be a feasibility study. The results can be used for general classifications of samples. Approximately 40 samples were analyzed. Contact: Institut de Police Scientifique, Universite de Lausanne, BCH, Lausanne-Dorigny 1015, Switz.]
2. Baer I, Margot P. **Sugar and fatty acid analysis in ecstasy tablets.** *Forensic Science International* 2007;167(2-3):229. [Editor's Notes: Two different GC/MS techniques were used. The results can be used for classifications of samples. 109 tablets were analyzed. Contact: Institut de Police Scientifique, Universite de Lausanne, BCH, Lausanne-Dorigny 1015, Switz.]



3. Bogusz MJ. **LC-MS of drugs of abuse and related compounds.** Applications of LC-MS in Toxicology 2006;149. [Editor's Notes: A Review. Contact: Department of Pathology and Laboratory Medicine, King Faisal Specialist Hospital and Research Centre, Riyadh, Saudi Arabia.]
4. Brown AJ, Lenehan CE, Francis PS, Dunstan DE, Barnett NW. **Soluble manganese (IV) as a chemiluminescence reagent for the determination of opiate alkaloids, indoles, and analytes of forensic interest.** Talanta 2007;71(5):1951. [Editor's Notes: Flow injection analysis was used; 16 different analytes were determined. Contact: School of Life and Environmental Sciences, Deakin University, Geelong 3217, Australia.]
5. Causin V, Marega C, Carresi P, Schiavone S, Marigo A. **A quantitative differentiation method for plastic bags by wide angle X-ray diffraction for tracing the source of illegal drugs.** Forensic Science International 2007;168(1):37. [Editor's Notes: 33 grocery bags were analyzed. Contact: Dipartimento di Scienze Chimiche dell'Universita, via Marzolo 1, Padua 35131, Italy.]
6. Levy R, Zelkowicz A, Abu E, Ravreby MD. **"Life expectancy" of "ecstasy" tablets in Israel in the years 2001 - 2003.** Forensic Science International 2007;167(1):22. [Editor's Notes: Tracked the logos on ecstasy tablets from first to last appearance (average was 9 months). Contact: Analytical Chemistry Laboratory, National Police Headquarters, Division of Identification and Forensic Science (DIFS), Haim Bar-Lev Road, Jerusalem 91906, Israel.]
7. Locicero S, Hayoz P, Esseiva P, Dujourdy L, Besacier F, Margot P. **Cocaine profiling for strategic intelligence purposes. A cross-border project between France and Switzerland.** Forensic Science International 2007;167(2-3):220. [Editor's Notes: Presents the results of an effort to optimize and harmonize the profiling techniques used to analyze cocaine by GC at two different laboratories. A number of different parameters (derivatizing agents, storage conditions, solvents, etc.) were tracked. Eight different cocaine alkaloids were the basis of the signature. Contact: Institut de Police Scientifique, Ecole des Sciences Criminelles, Universite de Lausanne, BCH, Lausanne-Dorigny 1015, Switz.]
8. Martello S, Felli M, Chiarotti M. **Survey of nutritional supplements for selected illegal anabolic steroids and ephedrine using LC-MS/MS and GC-MS methods, respectively.** Food Additives & Contaminants 2007;24(3):258. [Editor's Notes: 64 nutritional supplements were analyzed; 8 were found to contain banned substances. Contact: Istituto Medicina Legale, Universita Cattolica del Sacro Cuore, I-00168 Rome, Italy.]
9. Matsumoto T, Kikura-Hanajiri R, Kamakura H, Kawahara N, Goda Y. **Identification of N-methyl-4-(3,4-methylenedioxyphenyl)butan-2-amine, distributed as MBDB.** Journal of Health Sciences 2006;52(6):805. [Editor's Notes: The title compound (abbreviated by the authors as "HMDMA") is the positional isomer of MBDB, and is being sold in Japan. The characterization of this compound, and its comparison with MBDB and related compounds, is presented. Contact: National Institute of Health Sciences, Tokyo, Japan 158-8501.]
10. Mohammadzai IU, Khan M, Irfan M, Khan N, Usman S. **Physical characteristics, inorganic constituents, and trace metals determination in the street-vended samples of heroin.** Pakistan Journal of Scientific and Industrial Research 2006;49(4):251. [Editor's Notes: Samples from 4 different regions of the Northwest Frontier province were compared with samples from Peshawar city and a pure heroin standard. The analytical method was not reported in the abstract. Contact: Department of Chemistry, University of Peshawar, Peshawar, Pak.]

11. Shibuya EK, Sarkis JES, Negrini-Neto O, Martinelli LA. **Carbon and nitrogen stable isotopes as indicative of geographical origin of marijuana samples seized in the city of Sao Paulo (Brazil).** Forensic Science International 2007;167(1):8. [Editor's Notes: About 150 samples were analyzed. The technique was not specified in the abstract (but was likely IRMS, based on the authors' prior work in this field (see below)). Contact: Laboratorio de Caracterizacao Quimica e Isotopica, Centro de Quimica e Meio Ambiente, Instituto de Pesquisas Energeticas e Nucleares, IPEN/CNEN-SP, Av. Lineu Prestes 2242, Cidade Universitaria, Sao Paulo, SP CEP 05508-900, Brazil. This article appears to be a followup to: Shibuya EK, Souza-Sarkis JE, Negrini-Neto O, Moreira MZ, Victoria RL. **Sourcing Brazilian marijuana by applying IRMS analysis to seized samples.** Forensic Science International 2006;160(1):35.]
12. Terrettaz-Zufferey A-L, Ratle F, Ribaux O, Esseiva P, Kanevski M. **Pattern detection in forensic case data using graph theory: Application to heroin cutting agents.** Forensic Science International 2007;167(2-3):242. [Editor's Notes: Uses pattern recognition techniques to establish links between samples (the specific cutting agents were not detailed in the abstract). Contact: Institut de Police Scientifique et de Criminologie, Ecole des Sciences Criminelles, Universite de Lausanne, Batochime CH-1015, Switz.]

#### **Additional References of Possible Interest:**

1. Ebejer KA, Winn J, Carter JF, Sleeman R, Parker J, Koerber F. **The difference between drug money and a "lifetime's savings."** Forensic Science International 2007;167(2-3):94. [Editor's Notes: Examines the rate of transfer of heroin from contaminated to non-contaminated bills, under three different scenarios. Contact: Building 20F, Golf Course Lane, Mass Spec Analytical Ltd., P.O. Box 77, Filton, Bristol BS34 7QS.]
2. Gosav S, Praisler M, Dorohoi DO. **ANN expert system screening for illicit amphetamines using molecular descriptors.** Journal of Molecular Structure 2007;834-836:188. [Editor's Notes: Presents the use of an artificial neural network to predict the biological activity of various amphetamines and related compounds, based on the activity of known illicit amphetamines and other related compounds. The database was created based on 146 compounds (none specified in the abstract). Contact: Department of Physics, "Dunarea de Jos" University, Str. Domneasca nr. 47, Galati, Rom.]
3. Kotrly M. **Using X-ray diffraction in forensic science.** Zeitschrift fuer Kristallographie 2007;222(3-4):193. [Editor's Notes: A review (may include illicit drugs). Contact: Institute of Criminalistics Prague, Prague 170 82/7, Czech Rep.]
3. Ninomiya T. **Synchrotron radiation for scientific criminal investigation.** Feramu 2007;12(2):65. [Editor's Notes: A review (may include illicit drugs). This article is written in Japanese. Contact: Japan Synchrotron Radiation Research Institute (JASRI), Japan.]
4. Ridder T, Ver Steeg B, McNally J, Maynard JD, Abbink RE. **Apparatus and method for noninvasively monitoring for the presence of alcohol or substances of abuse in controlled environments.** (Patent) Chemical Abstracts 2007;146:310844f.
5. Willis RC. **Noninvasive testing for counterfeit drugs.** Analytical Chemistry 2007;79(5):1773. [Editor's Notes: A quick overview of the use of Spatially Offset Raman Spectroscopy to identify pharmaceutical products through packaging. The focus is identification of counterfeits and generic products. Contact: No contact information was provided.]



## SCIENTIFIC MEETINGS

**Title:** CLIC 17th Annual Technical Training Seminar

(First Posting)

**Sponsoring Organization:** Clandestine Laboratory Investigating Chemists Association

**Inclusive Dates:** September 4 - 8, 2007

**Location:** Flamingo Hotel, Las Vegas, NV (\$112/night plus tax)

**Contact Information:** Patty Dougherty ([pdougherty-at-stlouisco.com](mailto:pdougherty-at-stlouisco.com); 314/615-5366) or Roger Ely ([roger.ely-at-sbcglobal.net](mailto:roger.ely-at-sbcglobal.net); 925/787-6795)

**Website:** None

### Additional Details:

September 4th: Hallucinogenic Tryptamine and Phenethylamine Analogs Workshop

Cost: Members \$100; Non-Members \$125

Note: Limited to law enforcement personnel only

September 5th - 8th: Seminar

Cost: Members \$300; Non-Members \$350

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## EMPLOYMENT OPPORTUNITIES

**Position:** Forensic Scientist (Chemist)

(Third Posting)

**Location:** Montana Forensic Science Division; Missoula, Montana

**Salary:** \$42,931 to \$53,664

**Application Deadline:** July 15, 2007 (Faxed applications will not be accepted)

**Duties and Responsibilities:** Independently analyze evidence to identify controlled substances utilizing scientific testing procedures. Perform analyses of chemicals seized in clandestine laboratories to determine methods of manufacture and products produced. Identify adulterants, poisons, and discrepancies in product formulations related to product tampering investigation. Maintain accurate chain of custody records on evidence examined. Prepare written reports, including documentation of analyses performed and final conclusions. Provide expert testimony in courts of law. Experienced in maintaining scientific equipment, including quality control documentation. Provide instruction to law enforcement officers regarding evidence collection and preservation. Review casework for accuracy and adherence to standard operating procedures. The ideal applicant will also be proficient in the application of ASTM methods used in the analysis of fire debris. Performs other duties as assigned.

**Qualifications:** A minimum of a B.S. in Chemistry or related field with 3 years experience in a forensic laboratory specializing in the analysis of controlled substances. Additional experience in the analysis of fire debris is preferred.

**Contact:** Jim Hutchison, Chemical Analysis Supervisor  
Montana Forensic Science Division  
[jhutchison-at-mt.gov](mailto:jhutchison-at-mt.gov) (406/329-1114)

Applications may be obtained at: <http://mt.gov/statejobs/statejobs.asp>

\* \* \* \* \*

[Computer Corner will return in a future issue of *Microgram Bulletin*.]

# Microgram

## *Bulletin*

**Published by:**

The Drug Enforcement Administration  
Office of Forensic Sciences  
Washington, DC 20537

The U.S. Attorney General has determined that the publication of this periodical is necessary in the transaction of the public business required by the Department of Justice. Information, instructions, and disclaimers are published in the January issues.

- JULY 2007 -

**- INTELLIGENCE ALERT -**

**CLANDESTINE DIMETHYLTRYPTAMINE (DMT) LABORATORY  
SEIZED IN HOLLYWOOD, CALIFORNIA**

The Los Angeles Police Department's Scientific Investigation Division (SID; Los Angeles) recently received two gallons of an aqueous, dark brown solution, presumed to be a natural product extract containing N,N-dimethyltryptamine (DMT; see Photo 1, Label A), and one liter of a clear solution suspected to be a solution of purified DMT (Label C). The exhibits were recovered from a clandestine laboratory located at a residence in Hollywood, California by the Los Angeles Police and the SID's Hazardous Chemicals Team. A glove box and filter apparatus (not shown) were also seized. Of note, several of the first responding officers were made ill by chemical odors while securing the laboratory. The dark brown solution was basified with 10 percent ammonium hydroxide, and extracted with chloroform; analysis of the extract by GC/MS confirmed DMT (not quantitated, but estimated to be roughly 5 percent in the original solution). Analysis of the clear solution by GC/MS and color testing (Marquis (brown) and nitroprusside (negative)) confirmed DMT in naphtha (not



**Photo 1**

quantitated, but again estimated to be roughly 5 percent). The off-white, crystalline powder labelled as “B” shows DMT that was extracted from the dark brown solution and recrystallized from chloroform. The laboratory operator was apparently isolating DMT via naphtha extraction of a natural product, possibly *Mimosa hostilis* root. This is believed to be the first ever DMT clandestine laboratory in Los Angeles.

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### **- INTELLIGENCE ALERT -**

#### **“GANJA BUTTER” IN FAYETTEVILLE, ARKANSAS**

The Arkansas State Crime Lab (Little Rock) recently received a multi-exhibit submission including: A) A plastic storage container containing a cloudy brown liquid (430.0 mL) with brown sediment (see Photo 2) and three plastic storage containers containing a bi-layer consisting of a soft green solid (top) and a cloudy brown liquid (bottom), suspected to be a prepared form of marijuana called “ganja butter” (see Photo 3); and B) Five sugar cubes and a white crystalline substance (a crushed sugar cube), all suspected to contain LSD (no photos). The items were seized by the Fayetteville Police pursuant to a warrant search of a local residence (no further details). The suspects in the case provided the arresting officers with a copy of the recipe they used to prepare the “ganja butter.” The cloudy brown liquids had no odor, whereas the green solids had the odor of sour milk. The layers were sampled and tested separately. After acid/base workup, filtration, and extraction with methylene chloride, the extracts were analyzed by GC/MS and TLC. The brown cloudy liquid with sediment was confirmed to contain a small amount of  $\Delta^9$ -tetrahydrocannabinol (THC; not quantitated). All three green solids from the bi-layer exhibits (total net mass 928.7 grams) were also confirmed to contain THC (not quantitated but a moderate loading based on the TIC). However, the liquids from the bi-layer exhibits (total net volume 756.0 milliliters) were found to contain no controlled substances. The green, solid material was *not* plant material, but rather was the residue of the butter after the cook. This was the first submission of this type to the laboratory. The six sugar samples all fluoresced when viewed under UV light. After acid/base workup and extraction with methylene chloride, analysis by GC/MS and TLC confirmed LSD in five of the six exhibits (not quantitated, but a low concentration based on TIC); one of the cubes had only trace LSD, not confirmed. The laboratory receives LSD sugar cubes roughly once a year.



**Photo 2**



**Photo 3**

**- INTELLIGENCE ALERT -**

**VERY LARGE SEIZURE OF ECSTASY TABLETS (INCLUDING FAKES)  
AT THE BLAINE PORT OF ENTRY, WASHINGTON**

The DEA Western Laboratory (San Francisco, California) recently received 11 large, heat-sealed evidence envelopes containing a large number of tablets (total net mass approximately 72 kilograms), suspected Ecstasy (see Photo 4; closeups not available). The exhibits had been concealed in a false gas tank of a vehicle entering at the Blaine, Washington Port of Entry, and were seized by Immigration and Customs Enforcement agents. One envelope contained 8,729 green, biconvex tablets with a Batman logo (average mass 256 milligrams), 3,605 pale blue, flat beveled tablets with a dolphin logo (average mass 177 milligrams), and 164 pale blue, flat beveled tablets with a heart logo (average mass 178 milligrams). Analysis of the tablets by GC/MS and Marquis color testing confirmed MDMA in the green tablets (45.7 milligrams per tablet), but indicated no controlled substances in any of the blue tablets. Further analyses of the blue tablets by GC/FID affirmed no controlled substances and no basic or neutral soluble components. The tablets in the other 10 envelopes all contained MDMA. This was one of the largest ever submissions of Ecstasy tablets (but also the first submission in some time of Ecstasy tablet fakes) to the Western Laboratory.



**Photo 4**

\* \* \* \* \*

**- INTELLIGENCE ALERT -**

**HEROIN SMUGGLED IN SANDALS IN MEMPHIS, TENNESSEE**

The DEA North Central Laboratory (Chicago, Illinois) recently received one single and one intact pair of women's sandals, each containing a rectangular package of hard brown material hidden in their heels, suspected heroin (see Photo 5). The exhibits were seized by U.S. Immigration and Customs Enforcement personnel at an express mail hub in Memphis, Tennessee, and were en route from Mexico to Illinois. The sandals displayed no signs of tampering; the packets were wrapped in clear plastic and black carbon paper. Analysis of the brown material (total net mass 528.1 grams) by GC/FID, GC/MS, FTIR, and color tests confirmed 55 percent heroin hydrochloride, along with acetylcodeine, acetylmorphine, and papaverine (minor alkaloids not quantitated). This is believed to be the first submission of heroin smuggled in sandals to the North Central Laboratory.



**Photo 5**

\* \* \* \* \*

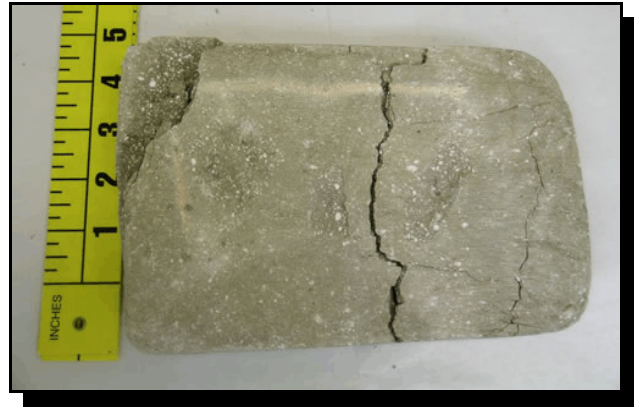


**- INTELLIGENCE ALERT -**

**UNUSUAL COCAINE BRICK IN NEW YORK, NEW YORK**

The DEA Northeast Laboratory (New York, New York) recently received a kilogram size brick of compressed brown powder containing small white specs, suspected cocaine (see Photo 6). The brick was seized in New York City by agents from the New York Field Division (details not provided). Analysis of the powder (total net mass 1005 grams) by GC/MS, GC/FID, and FTIR/ATR confirmed 72.3 percent cocaine hydrochloride, adulterated with procaine hydrochloride, hydroxyzine, and diltiazem (adulterants not quantitated). The white specs were not isolated for separate analysis.

The brick was somewhat unusual in its coloration, mixture of pharmaceutical adulterants, and presence of white specs. This is the first such submission to the Northeast Laboratory.



**Photo 6**

\* \* \* \* \*

**- INTELLIGENCE ALERT -**

**UNUSUAL CLANDESTINE AMPHETAMINE LABORATORY  
IN GUADALAJARA, MEXICO**

The DEA Special Testing and Research Laboratory (Dulles, Virginia) recently received three exhibits from a clandestine amphetamine laboratory in Guadalajara, Mexico (seizure details not provided). One exhibit was an off-white, lumpy powder, while the other two were amber to canary yellow, crystalline powders (see Photo 7). Analysis of the white powder (total net mass 17.5 grams) by GC/MS, FT/NMR, CE/UV, and FT/IR indicated 100 percent d,l-amphetamine hydrochloride. Analysis of the two yellow powders (total net mass 16.3 grams) by the same methods indicated 99 percent 1-phenyl-2-nitropropene. The synthetic route was not determined (there are several published procedures that detail the conversion of the 1-phenyl-2-nitropropene to either phenylacetone or directly to amphetamine). These are the first submissions of these types to the Special Testing and Research Laboratory.



**Photo 7**

**- INTELLIGENCE ALERT -**

**SHAM COCAINE IN RICHMOND, VIRGINIA**

**- Packaged as “Room Odorizers” -**

The DEA Mid-Atlantic Laboratory (Largo, Maryland) recently received 5 ziplock plastic bags, all labelled as “N St Room Odorizer” and containing white powder and bricks of compressed white powder, all suspected to be sham cocaine (see Photos 8 and 9). The bricks were irregularly shaped and had no logos. The exhibits were confiscated by DEA agents during a traffic stop in Richmond, Virginia, and it is suspected that they were going to be employed as a “drug rip,” because there is a cocaine shortage in the Richmond area. Analysis of the powder by GC, MS, and IR indicated a mixture of benzocaine and lactose in four of the bags (total net mass 4,007 grams), and a mixture of benzocaine, procaine, caffeine, and mannitol in the fifth bag (total net mass 1,027 grams); the various components were not quantitated. The Mid-Atlantic Laboratory has encountered similar mixtures of non-controlled substances packaged as room odorizers in two other cases.



**Photo 8**



**Photo 9**

\* \* \* \* \*

**SELECTED REFERENCES**

[Selected references are a compilation of recent publications of presumed interest to forensic chemists. Unless otherwise stated, all listed citations are published in English. Abbreviated mailing address information duplicates that provided by the abstracting service. Patents and Proceedings are reported only by their *Chemical Abstracts* citation number.]

1. Ali MS, Ghori M, Rafiuddin S, Khatri AR. **A new hydrophilic interaction liquid chromatographic (HILIC) procedure for the simultaneous determination of pseudoephedrine hydrochloride (PSH), diphenhydramine (DPH), and dextromethorphan hydrobromide (DXH) in cough-cold formulations.** Journal of Pharmaceutical and Biomedical Analysis 2007;43(1):158. [Editor's Notes: Presents the title study. Analyses were completed in less than 15 minutes. Contact: Jamjoon Pharmaceut Co Ltd, Ind Area, POB 6267, Phase 5, Jeddah 21442, Saudi Arabia.]



- 2a-d. (a) Andersson K, Jalava K, Lock E, Finnon Y, Huizer H, Kaa E, Lopes A, Poortman-van der Meer A, Cole MD, Dahlen J, Sippola E. **Development of a harmonised method for the profiling of amphetamines III.** Forensic Science International 2007;169(1):50. [Editor's Notes: Presents results for the GC profiling of amphetamine synthesized via three different methods (Leuckart, reductive amination, and nitrostyrene), with detection using FID, NPD, and MS. Contact: Swedish National Laboratory of Forensic Science - SKL, Linköping SE-581, Swed.] (b) Andersson K, Jalava K, Lock E, Huizer H, Kaa E, Lopes A, Poortman-van der Meer A, Cole MD, Dahlen J, Sippola E. **Development of a harmonised method for the profiling of amphetamines IV.** Forensic Science International 2007;169(1):64. [Editor's Notes: Compares the efficacy of liquid-liquid versus solid phase extractions for the above study. Contact: See above.] (c) Lock E, Aalberg L, Andersson K, Dahlen J, Cole MD, Finnon Y, Huizer H, Jalava K, Kaa E, Lopes A, Poortman-van der Meer A, Sippola E. **Development of a harmonised method for the profiling of amphetamines V.** Forensic Science International 2007;169(1):77. [Editor's Notes: Determines the stability of the methods, both over time and inter-lab, for the above study. Contact: See above.] (d) Andersson K, Lock E, Jalava K, Huizer H, Jonson S, Kaa E, Lopes A, Finnon Y, Poortman-van der Meer A, Sippola E, Dujourdy L, Dahlen J. **Development of a harmonised method for the profiling of amphetamines VI.** Forensic Science International 2007;169(1):86. [Editor's Notes: Continued the above study, determining 33 target compounds by GC/MS and peak areas. 26 of these compounds were found to be useful in determining degree of match. Contact: See above.]
3. Bell SC, Hanes RD. **A microfluidic device for presumptive testing of controlled substances.** Journal of Forensic Sciences 2007;52(4):884. [Editor's Notes: Amphetamine, cocaine, methamphetamine, and oxycodone were tested, using the cobalt thiocyanate, Marquis, and Simon color tests, and the platinic chloride microcrystal test. Contact: Bennett Department of Chemistry, West Virginia University, 217 Clark Hall, Morgantown, WV 26506.]
4. Bones J, Macka M, Paull B. **Evaluation of monolithic and sub 2 µm particle packed columns for the rapid screening for illicit drugs - Application to the determination of drug contamination on Irish Euro banknotes.** Analyst 2007;132(3):208. [Editor's Notes: Presents the title study, using the column in an LC-MS/MS. The analyses were significantly more sensitive versus a previously used GC-MS/MS method. Contact: National Centre for Sensor Research, School for Chemical Sciences, Dublin City University, Dublin, Ire. 9.]
5. Brettell TA, Butler JM, Almirall JR. **Forensic science.** Analytical Chemistry 2007;79(12):4365. [Editor's Notes: A review (the latest in the authors' biannual review of the field; includes extensive references on controlled substances). Contact: Department of Chemical and Physical Sciences, Cedar Crest College, Allentown, PA 18104.]
6. Casale JF. **Cocaethylene as a component in illicit cocaine.** Journal of Analytical Toxicology 2007;31(3):170. [Editor's Notes: A Letter to the Editor. Contact: DEA Special Testing & Res Lab, Cocaine Signature Program, 22624 Dulles Summit Court, Dulles, VA 20166.]
7. Casale JF, Hays PA, Toske SG, Berrier AL. **Four new illicit cocaine impurities from the oxidation of crude cocaine base: Formation and characterization of the diastereomeric 2,3-dihydroxy-3-phenylpropionylecgonine methyl esters from cis- and trans- cinnamoylcocaine.** Journal of Forensic Sciences 2007;52(4):860. [Editor's Notes: Cocaine that was oxidized with potassium permanganate under neutral conditions produced the title impurities (which have been recently identified in illicitly produced cocaine). Contact: Special Testing and Research Laboratory, Drug Enforcement Administration, 22624 Dulles Summit Court, Dulles, VA 20166.]

8. Casale J, Lydon J. **Apparent effects of glyphosate on alkaloid production in coca plants grown in Colombia.** Journal of Forensic Sciences 2007;52(3):573. [Editor's Notes: Presents the title study. Coca leaf from treated plants (that survived) were nearly devoid of cocaine, and also had some new, unusual tropane alkaloids. Contact: Special Testing and Research Laboratory, Drug Enforcement Administration, 22624 Dulles Summit Court, Dulles, VA 20166.]
9. Collins M, Heagney A, Cordaro F, Odgers D, Tarrant G, Stewart S. **Methyl 3-[3',4'-(methylenedioxy)phenyl]-2-methyl glycidate: An Ecstasy precursor seized in Sydney, Australia.** Journal of Forensic Sciences 2007;52(4):898. [Editor's Notes: A large amount of the title compound was seized, and was found to be easily converted to MDP2P. Analytical data is presented. Contact: National Measurement Institute, Australian Forensic Drug Laboratory, 1 Suakin St., Pymble, Sydney, NSW 2073, Australia.]
10. Diozan D, Baheri T, Pournaghi-Azar MH. **Development of electro solid-phase microextraction and application to methamphetamine analysis.** Chromatographia 2007;65(1-2):45. [Editor's Notes: Homemade pencil-lead fibers were used, and were found to be "much more selective" than direct SPME with commercially available polyacrylate fiber. Analyses were done by GC and GC/MS. Contact: Univ Tabriz, Fac Chem, Tabriz, Iran.]
11. Gao Y, Xiang Q, Xu YH, Tian YL, Wang EK. **The use of CE - electrochemiluminescence with ionic liquid for the determination of bioactive constituents in Chinese traditional medicine.** Electrophoresis 2006;27(23):4842. [Editor's Notes: The title method was used to determine the amounts of opium alkaloids in poppies. Contact: Chinese Acad Sci, Changchun Inst Appl Chem, State Key Lab Electroanal Chem, Changchun 130021, Peoples R China.]
12. Hindson BJ, Francis PS, Purcell SD, Barnett NW. **Determination of opiate alkaloids in process liquors using capillary electrophoresis.** Journal of Pharmaceutical and Biomedical Analysis 2007;43(3):1164. [Editor's Notes: Presents the title study, using CZE with UV detection for determination of morphine, codeine, oripavine, and thebaine in industrial process liquors. The LOD was  $2.5 \times 10^{-6}$ . Contact: Deakin Univ, Sch Life & Environm Sci, Geelong, Vic 3217, Australia.]
13. Levy R, Zelkowicz A. **Efficiency evaluation of a police operation to fight the drug plague: Distribution unit weight as an objective index.** Journal of Forensic Sciences 2007;52(4):909. [Editor's Notes: Focused on the average weights of street doses of heroin before, during, and after an extended counter-drug effort in an Israeli city. Contact: Analytical Chemistry Laboratory, Division of Identification and Forensic Science (DIFS), National Police Headquarters, Jerusalem, Israel.]
14. McLeod V, Ketcham G. **The safety guys: Introduction to clandestine drug laboratories - A serious health and safety concern.** Forensic Magazine 2007;4(3):48. [Editor's Notes: An overview. Contact. No address information was provided; email: [thesafetyguys-at-forensicmag.com](mailto:thesafetyguys-at-forensicmag.com)]
15. Nguyen XT, Hoang MH, Do DN, Tran vS. **Establishment of the method for analysis of solvent residue in heroin samples to track the origin.** Tap Chi Duoc Hoc 2007;47(2):34. [Editor's Notes: Presents the title analyses, using Headspace-GC. 11 solvents were detected. This article is written in Vietnamese. Contact: Inst. of Forensic Science, Vietnam (no further addressing information was provided).]
16. Shibuya EK, Sarkis JES, Negrini-Neto O, Ometto JPHB. **Multivariate classification based on chemical and stable isotopic profiles in sourcing the origin of marijuana samples seized in**

- Brazil.** Journal of the Brazilian Chemical Society 2007;18(1):205. [Editor's Notes: Marijuana from the main production regions in Brazil were differentiated based on their elemental compositions, as determined by HR-ICP-MS. The results compared favorably with a similar study based on stable isotope (C and N) analyses. Contact: Laboratorio de Caracterizacao Quimica e Isotopica, Centro de Quimica e Meio Ambiente, Instituto de Pesquisas Energeticas e Nucleares, IPEN/CNEN-SP, 05508-970 Sao Paulo, Brazil.]
17. Thigpen AL, DeRuiter J, Clark CR. **GC-MS studies on the regioisomeric 2,3- and 3,4-methylenedioxyphenethylamines related to MDEA, MDMMA, and MBDB.** Journal of Chromatographic Science 2007;45(5):229. [Editor's Notes: Presents the synthesis, gas chromatography, and gas chromatography - mass spectra of MDEA, MDMMA, MBDB, and their 2,3- positional isomers. Contact: Department of Pharmacal Sciences, School of Pharmacy, Auburn University, Auburn, AL 36849.]
  18. van Deursen MM, Lock ERA, Poort-van der Meer AJ. **Organic impurity profiling of 3,4-methylenedioxymethamphetamine (MDMA) tablets seized in the Netherlands.** Science & Justice 2006;46(3):135. [Editor's Notes: A "new method" was used for impurity profiling of 82 tablets from presumed unrelated large seizures (no details provided in the abstract). The discrimination power of the method was assessed by GC/MS analysis. Several new impurities were detected and identified. Contact: Netherlands Forensic Institute, The Hague 2490AA, Neth.]
  19. VanNimmen NFJ, Veulemans HAF. **Validated GC-MS analysis for the determination of residual fentanyl in applied Durogesic® reservoir and Durogesic® D-Trans® Matrix transdermal fentanyl patches.** Journal of Chromatography B - Analytical Technologies in the Biomedical and Life Sciences 2007;846(1-2):264. [Editor's Notes: Presents the title study. Contact: Catholic Univ Louvain, Dept Occupat Environm & Insurance Med, Lab Occupat Hyg & Toxicol, Kapucijnenvoer 35, 6th Floor, B-3000 Louvain, Belgium.]
  20. Verheyden K, Le Bizec B, Courtheyn D, Mortier V, Vandewiele M, Gillis W, Vanthemsche P, De Brabander HF, Noppe H. **Mass spectrometric detection of and similarities between 1-androgens.** Analytica Chimica Acta 2007;586(1-2):57. [Editor's Notes: 1-Testosterone, 1-androstene-3 $\beta$ ,17 $\beta$ -diol and several other "new" anabolic steroids (not specified in the abstract) were analyzed with GC/MS and LC-MS/MS. The abstract implies analysis of marketed samples and seizures, not of biological matrices. Contact: Faculty of Veterinary Medicine, Department of Veterinary Public Health and Food Safety, Laboratory of Chemical Analysis, Ghent University, B-9820 Merelbeke, Belg.]
  21. Westphal F, Junge T, Roesner P, Fritschi G, Klein B, Girreser U. **Mass spectral and NMR spectral data of two new designer drugs with an  $\alpha$ -aminophenone structure: 4'-Methyl- $\alpha$ -pyrrolidinohexanophenone and 4'-methyl- $\alpha$ -pyrrolidinobutyrophenone.** Forensic Science International 2007;169(1):32. [Editor's Notes: Presents the title study. Contact: Sachgebiet Toxikologie/Betaeubungsmittel, Landeskriminalamt Schleswig-Holstein, Muehlenweg 166, Kiel 24116, Germany.]
  22. Willis RC. **Noninvasive testing for counterfeit drugs.** Analytical Chemistry 2007;79(5):1773. [Editor's Notes: A brief overview of Spatially Offset Raman Spectroscopy (SORS). Contact: No contact information was provided.]
  23. Zhang LL, Chen Y, Lin M, Fan GR, Zhao WQ, Wu YT. **Fast CE determination of d-amphetamine and diphenhydramine in quick-acting anti-motion capsules.** Chromatographia 2007;65(5-6):305. [Editor's Notes: Presents the title study, using CZE. Analyses were

completed in less than 2 minutes. The substrates appeared to be biological fluids, not the actual capsules (the abstract is not clear). Contact: Shanghai Inst Drug Control, 615 Liuzhou Rd, Shanghai 200233, Peoples R China.]

#### **Additional References of Possible Interest:**

1. Ammann AA. **Inductively coupled plasma mass spectrometry (ICP MS): A versatile tool.** Journal of Mass Spectrometry 2007;42(4):419. [Editor's Notes: A tutorial article. Contact: EAWAG, Swiss Federal Institute of Aquatic Science and Technology, Duebendorf, Switz.]
2. Forrester MB. **Adderall abuse in Texas, 1998 - 2004.** Journal of Toxicology and Environmental Health, Part A 2007;70(7):658. [Editor's Notes: A survey, based on telephone calls to Poison Control Centers. Contact: Texas Department of State Health Services, Austin, TX (zip code not provided).]
3. Gayton-Ely M, Shakleya DM, Bell SC. **Application of a pyroprobe to simulate smoking and metabolic degradation of abused drugs through analytical pyrolysis.** Journal of Forensic Sciences 2007;52(2):473. [Editor's Notes: Presents the title study, on cocaine and methamphetamine. Analyses of the pyrolytic products was done by GC/MS. In additional experiments, several common diluents were added to the cocaine or methamphetamine and the mixtures pyrolyzed. Contact: Bennett Department of Chemistry, West Virginia University, Morgantown, WV 26506.]
4. Khayamian T, Jafari MT. **Design for electrospray ionization - ion mobility spectrometry.** Analytical Chemistry 2007;79(8):3199. [Editor's Notes: Presents a new design for ESI-IMS. The test mixture included codeine and morphine. Contact: Isfahan Univ Technol, Dept Chem, Isfahan 84154, Iran.]
5. Kindcade K. **An 'old' technique finds new life in the nano world.** Laser Focus World 2006;42(10):109. [Editor's Notes: An overview of forensic applications of Surface Enhanced Raman Scattering (SERS); illicit drugs are mentioned in the abstract. Contact: Eng (no further addressing information was provided).]
6. Phipps M, Petricevic S. **The tendency of individuals to transfer DNA to handled items.** Forensic Science International 2007;168(2-3):162. [Editor's Notes: Investigates the factors that influence DNA transfers, including differing "shedding abilities." Contact: Forensic Biology Group, The Institute of Environmental Science and Research Limited, Mt Albert Science Centre, Private Bag, Auckland 92-021, N.Z.]
7. Seifulla RD, Rozhkova EA, Rodchenko GM, Applonova SA, Kulikova EV. **Doping in sports.** Eksperimental'naya i Klinicheskaya Farmakologiya 2006;69(6):68. [Editor's Notes: An overview and review. This article is written in Russian. Contact: Laboratory of Clinical Pharmacology and Antidoping Monitoring, Moscow Scientific - Practical Center of Sport Medicine, Moscow 107120, Russia.]
8. Shiyahovsky B, Di L, Weizmann Y, Nowarski R, Kotler M, Willner I. **Spotlighting of cocaine by an autonomous aptamer-based machine.** Journal of the American Chemical Society 2007;129(13):3814. [Editor's Notes: The LOD is  $5 \times 10^{-6}$ . Contact: Hebrew Univ Jerusalem, Inst Chem, IL-91904 Jerusalem, Israel.]

9. Zhang ZY, An LY, Hu WX, Xiang YH. **3D-QSAR study of hallucinogenic phenylalkylamines by using CoMFA approach.** Journal of Computer-Aided Molecular Design 2007;21(4):145. [Editor's Notes: Presents the title study, using 90 selected PAA compounds as models. Contact: Capital Normal Univ, Dept Chem, 105 Xisanhuan N, Beijing 100037, Peoples R China.]

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## THE JOURNAL/TEXTBOOK COLLECTION EXCHANGE

The Journal/Textbook Collection Exchange is a service intended to facilitate the transfer of unwanted journals and textbooks to forensic libraries or other *Microgram* subscribers. At present, this service is offered once a quarter (in January, April, July, and October). The current donations are listed below. The offers are First Come/First Serve (except libraries have preference). There are no charges to the requestor. Provide full mailing address in request. **Important!:** Do not provide an address that irradiates mail!

- \* *British Medical Journal, International Edition*, 1996 and 1997 (all), and 1999 (July - Dec.); 16 mm film.
- \* Inaba and Cohen. *Uppers, Downers, All Arounders*. 5th Edition (2004). [2 Copies Available.]
- \* *Journal of Clinical Pharmacology*; 2004 (all); 16 mm film.
- \* *Journal of Drug Issues*, Volumes 20 - 26; 16 mm film.
- \* *Journal of Toxicology - Clinical Toxicology*, 1995 and 1996 (all); 35 mm film.
- \* *Lancet*; Issues 9095-9120 (Jan. - June 1998) and Issues 9172-9196 (July - Dec. 1999); 16 mm film.
- \* Physician's Desk Reference, 58th Edition (2004).

**All subscribers are encouraged to donate surplus or unwanted items/collections.** Reference texts and long runs of forensic/analytical journals are of particular interest; however, even single issues are worthwhile. If interested, please consult the *Microgram* website or contact the *Microgram* Editor for further instructions.

The next offering of journals and textbooks will be in the October 2007 issue of *Microgram Bulletin*.

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## THE DEA FY 2007 AND FY 2008 STATE AND LOCAL FORENSIC CHEMISTS SEMINAR SCHEDULE

The remaining FY 2007 schedule for the DEA's State and Local Forensic Chemists Seminar is as follows:

September 10 - 14, 2007

The FY 2008 schedule is as follows:

November 26 - 30, 2007

March 10 - 14, 2008

[Continued Next Page.]

May 5 - 9, 2008  
September 8 - 12, 2008

The school is open only to forensic chemists working for law enforcement agencies, and is intended for chemists who have completed their agency's internal training program and have also been working on the bench for at least one year. There is no tuition charge. The course is held at the AmeriSuites Hotel in Sterling, Virginia (near the Washington/Dulles International Airport). A copy of the application form is reproduced on the last page of the August 2004 issue of *Microgram Bulletin*. (See: <http://www.dea.gov/programs/forensicsci/microgram/mg0804/aug04.pdf>) Completed applications should be mailed to the Special Testing and Research Laboratory (Attention: J. Head) at: 22624 Dulles Summit Court, Dulles, VA 20166. For additional information, call 703/668-3349.

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## SCIENTIFIC MEETINGS

**1. Title:** CLIC 17th Annual Technical Training Seminar (Second Posting)  
**Sponsoring Organization:** Clandestine Laboratory Investigating Chemists Association  
**Inclusive Dates:** September 4 - 8, 2007  
**Location:** Flamingo Hotel, Las Vegas, NV (\$112/night plus tax)  
**Contact Information:** Patty Dougherty ([pdougherty-at-stlouisco.com](mailto:pdougherty-at-stlouisco.com); 314/615-5366) or Roger Ely ([roger.ely-at-sbcglobal.net](mailto:roger.ely-at-sbcglobal.net); 925/787-6795)  
**Website:** None

### Additional Details:

September 4th: Hallucinogenic Tryptamine and Phenethylamine Analogs Workshop  
Cost: Members \$100; Non-Members \$125  
Note: Limited to law enforcement personnel only

September 5th - 8th: Seminar  
Cost: Members \$300; Non-Members \$350

\* \* \* \* \*

**2. Title:** 33rd Annual NEAFS Meeting (Second Bimonthly Posting)  
**Sponsoring Organization:** Northeastern Association of Forensic Sciences  
**Inclusive Dates:** October 31 - November 3, 2007  
**Location:** Sagamore Resort (Bolton Landing, New York)  
**Contact Information:** Adrian S. Krawczeniuk ([Adrian.S.Krawczeniuk-at-usdoj.gov](mailto:Adrian.S.Krawczeniuk-at-usdoj.gov); 212/620-4923)  
**Website:** [www.neafs.org](http://www.neafs.org)

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[Computer Corner will return in a future issue of *Microgram Bulletin*.]



# Microgram

## *Bulletin*

**Published by:**

The Drug Enforcement Administration  
Office of Forensic Sciences  
Washington, DC 20537

The U.S. Attorney General has determined that the publication of this periodical is necessary in the transaction of the public business required by the Department of Justice. Information, instructions, and disclaimers are published in the January issues.

- AUGUST 2007 -

**- INTELLIGENCE ALERT -**

**“GANJA BUTTER” IN SAN BERNARDINO, CALIFORNIA**

The San Bernardino County Sheriff's Scientific Investigations Division (California) recently received five mason jars, each containing a thick green liquid covering a layer of apparent minced plant material suspended in a brown liquid, alleged to be an intermediate preparation of “ganja butter” (marijuana extracted with butter; see Photo 1). The exhibits were seized from a refrigerator at a San Bernardino residence by agents from the San Bernardino County Sheriff's Department Narcotics Unit, pursuant to a search warrant. Each mason jar contained approximately 400 milliliters of material (combined green liquid and brown liquid), for a net total of approximately 2 liters. Analysis of the green liquid by Duquenois-Levine color test and TLC confirmed the presence of cannabinoids (not quantitated, but primarily THC with small amounts of cannabinol



**Photo 1**

and cannabidiol). The suspect indicated that he was making the “ganja butter” for medicinal use, and that he had been told that ingesting the “butter” was healthier than smoking the marijuana. This is the first such submission to the laboratory.

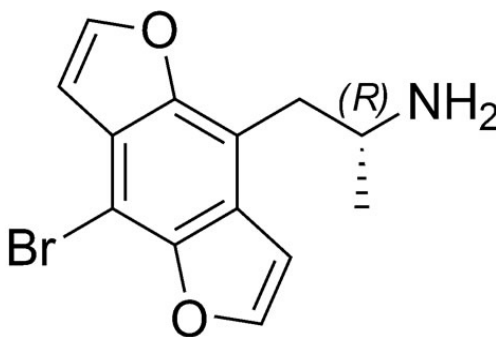
[Editor’s Notes: A very similar exhibit of “ganja butter” was reported in the July, 2007 issue of *Microgram Bulletin*; that seizure was made in Fayetteville, Arkansas. The green color of the upper (butter) layer is apparently due to extraction of the chlorophyll from the marijuana.)

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### **- INTELLIGENCE ALERT -**

#### **“BROMO DRAGONFLY” (BROMO-BENZODIFURANYL-ISOPROPYLAMINE) IN ASHLAND, OREGON**

The Oregon State Police Central Point Laboratory recently received a small amber dropper bottle containing approximately 3 milliliters of a clear colorless liquid, submitted as “Bromo” and suspected to be a solution of 2,5-dimethoxy-4-bromoamphetamine (DOB) (no photos). The exhibit was seized at a residence in Ashland, Oregon by the Ashland Police, pursuant to a consent search. A small amount of marijuana and a set of scales were also seized. The solution was determined to be aqueous, with a pH of approximately 5. Analysis by GC/MS, UV/Vis, and FTIR/ATR, however, indicated not DOB but rather bromo-benzodifuranyl-isopropylamine (also known as “Bromo Dragonfly”; see Figure 1). The identification was not confirmed due to lack of a standard; however, the mass spectrum matched the literature. The solution was not quantitated but was a moderate loading based on the TIC. This is the first submission of this type to the Oregon State Police laboratory system.



**Figure 1 - “Bromo Dragonfly”**  
**(1-(8-Bromobenzo[1,2-*b*:4,5-*b'*]difuran-4-yl)-2-aminopropane**  
**C<sub>13</sub>H<sub>12</sub>BrNO<sub>2</sub>; mw = 294.14**

[Editor’s Notes: Currently, there is only sparse information available on this compound. It is allegedly a long-lasting, DOB-like hallucinogen with a dosage unit of approximately 0.5 milligrams. In contrast to most amphetamine-like compounds, the R configuration is reportedly the more active enantiomer. This is the first report of this compound in *Microgram*.]

**- INTELLIGENCE ALERT -**

**“LIQUID OXYCONTIN” IN PORT ST. LUCIE, FLORIDA**

The Indian River Crime Laboratory (Fort Pierce, Florida) recently received a plastic 35-mm film vial containing an odorless, syrupy yellow liquid, suspected “Liquid Oxycontin” (no photo). The exhibit was obtained in Port St. Lucie in an undercover operation by the Port St. Lucie Police Department (no further information). Analysis of the liquid (total net volume (mass) 3.5 milliliters (4.2 grams)) by Marquis, UV/Vis, and GC/MS confirmed a solution of oxycodone, cut with sorbitol (or mannitol or another diastereomer of sorbitol). The solution was not quantitated, but an unusually strong UV absorption by the neat solution, and a very strong TIC peak from an extract following acid/base workup, indicated a high concentration of oxycodone. This was the first ever submission of “Liquid Oxycontin” to the laboratory, and informal inquiries suggest that it is the first such submission to any forensic/crime laboratory in Florida.

[*Analyst’s Notes:* The solution does not appear to be oxycodone tablets dissolved in water or alcohol. As similar liquid pharmaceutical formulations of oxycodone containing sorbitol are known, the solution is likely a diverted pharmaceutical preparation. *Editor’s Notes:* A similar suspected liquid pharmaceutical formulation of oxycodone was reported by the Charleston (South Carolina) Police Forensic Laboratory in the October, 2005 issue of *Microgram Bulletin*.]

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**- INTELLIGENCE ALERT -**

**N-BENZYL METHYLAMINE HCL AND N-BENZYLETHYLAMINE HCL (“ICE” AND CRYSTAL METHAMPHETAMINE MIMICS) IN THE SOUTHWEST**

The DEA Southwest Laboratory (Vista, California) has recently received various exhibits of white, crystalline powders and “Ice”-like crystals, presumed methamphetamine (see Photos 2 and 3). The exhibits were also packaged similar to bulk methamphetamine (for example, in plastic containers wrapped with cellophane and tape, in zip-lock plastic bags, etc.). Analyses by Marquis (negative), nitroprusside (positive), GC/MS, and FTIR/ATR, however, indicated not



**Photo 2 - N-Benzylmethylamine  
Hydrochloride**



**Photo 3 - N-Benzylethylamine  
Hydrochloride**

methamphetamine but rather N-benzylmethamphetamine or N-benzylethylamine, in some cases uncut and in others cut with dimethylsulfone. Some of the exhibits were co-packaged with other methamphetamine exhibits, and at least one exhibit contained a mixture of methamphetamine and N-benzylmethamphetamine. Exhibits have been submitted both from the southwest border and from within the United States, including from Nogales and Phoenix, Arizona, San Diego, California, and Las Vegas, Nevada. The Southwest Laboratory has previously encountered various methamphetamine mimic samples, but not of N-benzylmethamphetamine or N-benzylethylamine, and not on such a widespread scale. Neither N-benzylmethamphetamine or N-benzylethylamine are controlled, and neither give any noticeable CNS stimulant effects.

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### **- INTELLIGENCE ALERT -**

#### **MULTICOMPONENT ECSTASY TABLETS IN HOUSTON, TEXAS**

The DEA South Central Laboratory (Dallas, Texas) recently received a submission containing 5008 tablets of four different types, suspected Ecstasy (see Photos 4 - 7; note that the scale varies between the photos, and also that the colors are not true). The tablets were seized in Houston by agents from the FBI Houston Field Division (no further details). The subexhibits included: A) 1011 blue tablets with a flower logo (total net mass 250 grams); B) 1989 green tablets with the same flower logo (total net mass 500 grams); C) 1005 orange tablets with an apple logo (total net mass 247 grams); and D) 1003 light blue tablets with a duck logo (total net mass 262 grams). Analyses were conducted by GC/FID, GC/MS, and HPLC, and indicated: A) Blue tablets/flower logo: MDMA (94.1 milligrams/tablet), ketamine (not quantitated), methamphetamine (<5 percent), caffeine (not quantitated), procaine (not quantitated), and dimethyl sulfone (not quantitated). B) Green tablets/flower logo: MDMA (72.8 milligrams/tablet), ketamine (not quantitated), methamphetamine (<5 percent), procaine (not quantitated), and caffeine (not quantitated). C) Orange tablets/apple logo: MDMA (87.4 milligrams/tablet), ketamine (not quantitated), methamphetamine (<5 percent), caffeine (not quantitated), and dimethyl sulfone (not quantitated). D) Light blue tablets/duck logo: MDMA (92.4 milligrams/tablet), ketamine (not quantitated), and caffeine (not quantitated). Once unusual, these multicomponent type Ecstasy tablets have recently become very common in the region served by the South Central Laboratory.



**Photo 4 - "A" Tablets**



**Photo 5 - "B" Tablets**



**Photo 6 - "C" Tablets**



**Photo 7 - "D" Tablets**



**- INTELLIGENCE ALERT -**

**VERY LARGE SEIZURE OF DIMETHCATHINONE IN TAMPA, FLORIDA**

The DEA Southeast Laboratory (Miami, Florida) recently received 25 large cardboard boxes containing brown or off-white powders in large plastic bags, suspected dimethcathinone (see Photo 8). The exhibits were seized at the Tampa Customs Air Cargo warehouse by United States Border Patrol personnel. The boxes had been shipped from China, and were labeled either as “Green Tea Extract” or “Talcum Powder.” A preliminary analysis was conducted by the Florida Department of Law Enforcement/Tampa Laboratory, and identified dimethcathinone. Further analysis of the powder (total net mass 649.4 kilograms) by Southeast



**Photo 8 (15 of 25 Boxes)**

Laboratory personnel using GC/FID and GC/MS, and comparison with a reference standard (provided by the DEA North Central Laboratory), confirmed dimethcathinone (not quantitated, but some of the subexhibits were apparently high purity, while others were adulterated or cut). This is the first such submission to the Southeast Laboratory.

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**- INTELLIGENCE ALERT -**

**HEROIN CONCEALED IN MOTORCYCLE HELMETS IN NEW YORK, NEW YORK**

The DEA Northeast Laboratory (New York, New York) recently received two motorcycle helmets, each containing a concealed plastic bag of beige colored powder, suspected heroin (see Photo 9). The exhibits were seized in New York City by agents from the DEA New York Field Division (no further details). The bags were secreted between the shell and the liner. Analysis of the powders (total net mass 703 grams) by GC/FID, GC/MS, and FTIR/ATR confirmed 62 percent heroin hydrochloride, adulterated with thiamine (not quantitated). The Northeast



**Photo 9**

Laboratory routinely receives heroin concealed in various types of containers and packaging, but this is believed to be the first submission where heroin was smuggled in motorcycle helmets.

## SELECTED REFERENCES

[Selected references are a compilation of recent publications of presumed interest to forensic chemists. Unless otherwise stated, all listed citations are published in English. Abbreviated mailing address information duplicates that provided by the abstracting service. Patents and Proceedings are reported only by their *Chemical Abstracts* citation number.]

1. Dufey V, Dujourdy L, Besacier F, Chaudron H. **A quick and automated method for profiling heroin samples for tactical intelligence purposes.** *Forensic Science International* 2007;169(2-3):108. [Editor's Notes: Involves the derivation and GC separation of 5 major constituents in heroin (not identified in the abstract), and the computer-based processing of the data for profiling. Comparisons with trace impurity profiling techniques are discussed. Contact: Laboratoire de Police Scientifique de Lyon, 31 Avenue Franklin Roosevelt, Ecully 69134, Fr.]
2. Galimov EM, Sevast'yanov VS, Kul'bachevskaya EV, Golyavin AA. **The identification of the geographical origin of narcotic drugs based on the carbon and nitrogen isotope ratios.** *Mass-Spektrometriya* 2004;1(1):31. [Editor's Notes: Appears to be an overview. The drugs are not specified in the abstract. This article is written in Russian. Contact: Inst. Geokhim. Anal. Khim. Im. B.I. Vernadskogo, RAN, Moscow B-334, Russia.]
3. Gostic T, Klemenc S. **Evidence on unusual way of cocaine smuggling: Cocaine - polymethylmethacrylate (PMMA) solid solution - Study of clandestine laboratory samples.** *Forensic Science International* 2007;169(2-3):210. [Editor's Notes: Describes the analysis of samples taken from an abandoned clandestine laboratory in Slovenia, where cocaine was being extracted from a plastic matrix. Includes discussion concerning the presumed recovery methods. Contact: Forensic Science Institute, Ministry of the Interior, Vodovodna 95, Ljubljana 1000, Slovenia.]
4. Marinetti L. **History and pharmacology of  $\gamma$ -hydroxybutyric acid.** *Chromatographic Methods in Clinical Chemistry and Toxicology* 2007:197. [Editor's Notes: A review. Includes related information on GBL and 1,4-BD, and some analytical data for GHB. Contact: Montgomery County Coroners Office and Miami Valley Regional Crime Laboratory, 361 West Third Street, Dayton, OH 45402.]
5. Qi Y, Evans I, McCluskey A. **New impurity profiles of recent Australian imported "Ice": Methamphetamine impurity profiling and the identification of (pseudo)ephedrine and Leuckart specific marker compounds.** *Forensic Science International* 2007;169(2-3):173. [Editor's Notes: Presents the title study. Contact: Chemistry Building, The University of Newcastle, University Drive, Callaghan NSW 2308, Australia.]
6. Wu G-P, Xiang B-R. **A new method for fast and nondestructive analysis of heroin, 6-acetylmorphine, and codeine in drug by near infrared spectroscopy.** *Fenxi Huaxue* 2007;35(4):552. [Editor's Notes: The results were found to be in good agreement with GC and GC/MS analyses. This article is written in Chinese. Contact: Department of Science Technology, Jiangsu Police Institution, Nanjing 210012, Peop. Rep. China.]

### Additional References of Possible Interest:

1. Balogh MP. **Techniques for structure elucidation of unknowns: Finding substitute active pharmaceutical ingredients in counterfeit medicine.** *LCGC North America* 2007;25(6):554.



[Editor's Notes: A review, focusing on the use of LC-MS/MS. Contact: USA (no further addressing information was provided).]

2. Gross KC. **Passive tagging of pharmaceutical products with noble gas isotopes.** (Patent) Chemical Abstracts 2007;147:39338v.
3. Kelley CM, Zimmer BS, Toomey VM, Jones MB, Gratz SR, Prestridge R. **Differentiating authentic manufacturers of active pharmaceutical ingredients using a variety of techniques.** American Pharmaceutical Review 2006;9(7):96. [Editor's Notes: Methods for profiling of acyclovir, trazadone hydrochloride, and hydrochlorothiazide are presented. Contact: Forensic Chemistry Center, U.S. Food and Drug Administration, USA (no further addressing information was provided).]
4. Inciardi JA, Surratt HL, Kurtz SP, Cicero TJ. **Mechanisms of prescription drug diversion among drug-involved club- and street-based populations.** Pain Medicine 2007;8(2):171. [Editor's Notes: An overview of the varied means by which abusers obtain illicit drugs. Contact: Center for Drug and Alcohol Studies, University of Delaware, Coral Gables, Florida 33134.]
5. Reid G, Devaney ML, Baldwin S. **Drug production, trafficking, and trade in Asia and Pacific Island countries.** Drug and Alcohol Review 2006;25:647. [Editor's Notes: An overview. Contact: Centre for Harm Reduction, Burnet Institute, Melbourne, Victoria, Australia.]
6. Thevis M, Schaenzer W. **Emerging drugs - Potential for misuse in sport and doping control detection strategies.** Mini-Reviews in Medicinal Chemistry 2007;7(5):531. [Editor's Notes: A forward looking overview, including discussion of development of methods for detection of new doping agents. Contact: Institute of Biochemistry - Center for Preventive Doping Research, German Sport University Cologne, Cologne 50933, Germany.]
7. Wiseman JM, Laughlin BC. **Desorption electrospray ionization (DESI) mass spectrometry: A brief introduction and overview.** Current Separations and Drug Development 2007;22(1):11. [Editor's Notes: Described applications include counterfeit tablet identifications. Contact: Prosofia, Inc., Indianapolis, IN (zip code not provided).]

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# Microgram

## *Bulletin*

**Published by:**

The Drug Enforcement Administration  
Office of Forensic Sciences  
Washington, DC 20537

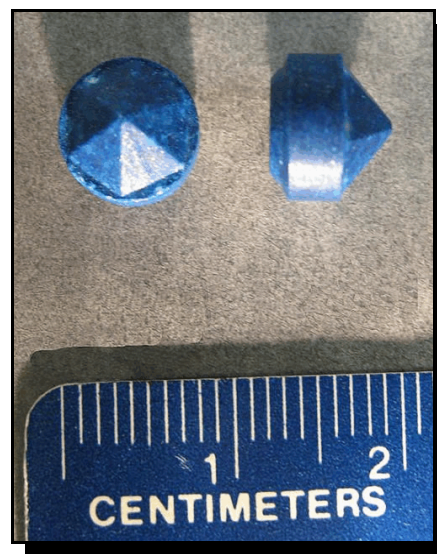
The U.S. Attorney General has determined that the publication of this periodical is necessary in the transaction of the public business required by the Department of Justice. Information, instructions, and disclaimers are published in the January issues.

- SEPTEMBER 2007 -

**- INTELLIGENCE ALERT -**

**UNUSUALLY SHAPED ECSTASY COMBINATION TABLETS (CONTAINING MDMA, METHAMPHETAMINE, CAFFEINE, PROCAINE, AND 1-(3,4-METHYLENEDIOXYPHENYL)-2-PROPANOL) IN RICHMOND, VIRGINIA**

The Virginia Department of Forensic Science, Central Laboratory (Richmond) recently received six small ziplock bags, each containing two unusually shaped, dark blue tablets, apparent Ecstasy (see Photo 1). The tablets were seized by the Petersburg Police pursuant to a local traffic stop, and were submitted as an unknown/suspected drug (Petersburg is about 25 miles south of Richmond). The tablets were approximately 8 millimeters in diameter, with a round base flat on one side and a six-sided pyramid shape on the other side. Analysis of the tablets (total net mass 3.81 grams) by color tests, TLC, and GC/MS indicated MDMA, methamphetamine, caffeine, procaine, and 1-(3,4-methylenedioxyphenyl)-2-propanol in an approximate ratio of 24:12:50:12:2 (based on the TIC; not formally quantitated). This is the first known submission of tablets with this unusual shape to the laboratory; however,



**Photo 1**

Ecstasy combination tablets are becoming more common at the Central Laboratory, especially those containing methamphetamine and caffeine.

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**- INTELLIGENCE ALERT -**

**UNUSUALLY PACKAGED AND SIZED HEROIN PACKAGES  
IN RUSSELLVILLE, ARKANSAS**

The Arkansas State Crime Laboratory (Little Rock) recently received four cucumber-shaped bundles containing a total of 191 small, bright green, cylindrical packages, each containing a compressed light brown powder, suspected heroin (see Photo 2). The exhibits were seized by the 5th Judicial District Drug Task Force pursuant to a traffic stop in Russellville (no further details; Russellville is about 75 miles north of Little Rock). The bundles were approximately 8 inches long and about 5 inches in circumference, and were composed of layers of brown tape, plastic, mustard, and blue balloon material. The packets were cylindrical, 2.5 centimeters in length by 1.5 centimeters in diameter. The powder was wrapped in clear plastic, which in turn was encased in a thin layer of hard, green plastic-like material (not identified). Analysis of the powder (total net mass 977.5 grams) by TLC, GC/FID, GC/MS, and FTIR confirmed 88.2 percent heroin hydrochloride. This was the first submission of heroin packaged in this unusual fashion to the laboratory.

[Editor's Notes: The cylinders are smaller than typical heroin pellets (and most heroin pellets are usually rounded for easier swallowing). It is unclear why the heroin was packaged in this manner.]



**Photo 2**

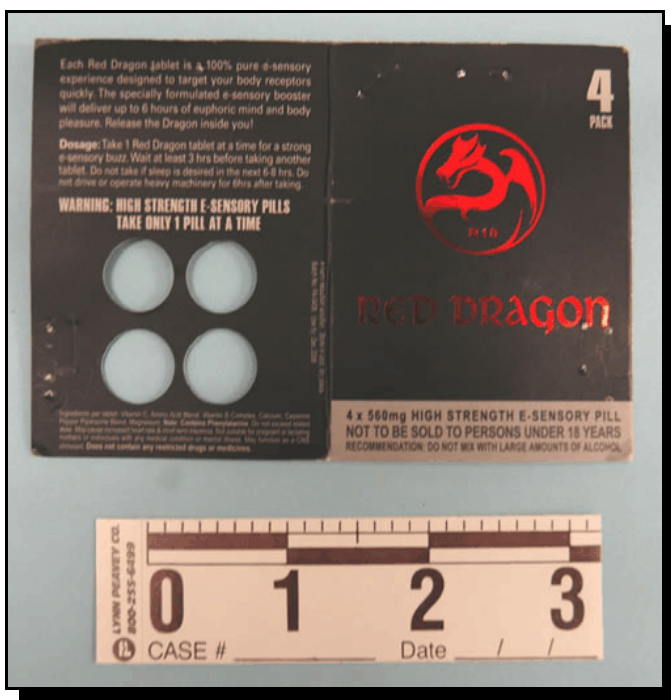
**- INTELLIGENCE ALERT -**

**“FLYING STAR” AND “RED DRAGON” TABLETS (CONTAINING BENZYLPIPERAZINE (BZP) AND TRIFLUOROMETHYLPHENYLPYPERAZINE (TFMPP)) IN COMMERCIAL-STYLE PACKAGING IN SINGAPORE**

The DEA Special Testing and Research Laboratory (Dulles, Virginia) recently received two apparently commercially produced packages, labelled as “Flying Star” and “Red Dragon,” each containing tablets and labelled as being natural supplements (see Photos 3 and 4). The packages were obtained in Singapore by Indonesian authorities (no further details), and were submitted as an unknown/possible drug substance. The “Flying Star” package contained one white tablet (net mass 0.56 grams), while the “Red Dragon” package contained three red tablets (total net mass 1.6 grams). The tablets were about the same diameter but were about 50 percent thicker than typical Ecstasy tablets. The packaging claimed that the products would boost energy for six to eight hours, and the “Red Dragon” package also claimed that the tablets would provide an “e-sensory experience.” The ingredients listed on both packages were identical, and included: Vitamin C, “amino acids,” and “cayenne pepper piperazine blend.” Analysis of the exhibits by NMR and GC/MS, however, found none of the listed ingredients but rather a mixture of N-benzylpiperazine (BZP; 155 milligrams/tablet in “Flying Star” and 68 milligrams/tablet in “Red Dragon”) and 1-(3-trifluoromethylphenyl)piperazine (TFMPP; not quantitated) in both exhibits. No other active compounds were found in either exhibit. The Special Testing and Research Laboratory has received submissions of BZP on three occasions over the past five years; however, these are the first submissions of BZP tablets in commercial-type packaging to the laboratory.



**Photo 3**



**Photo 4**

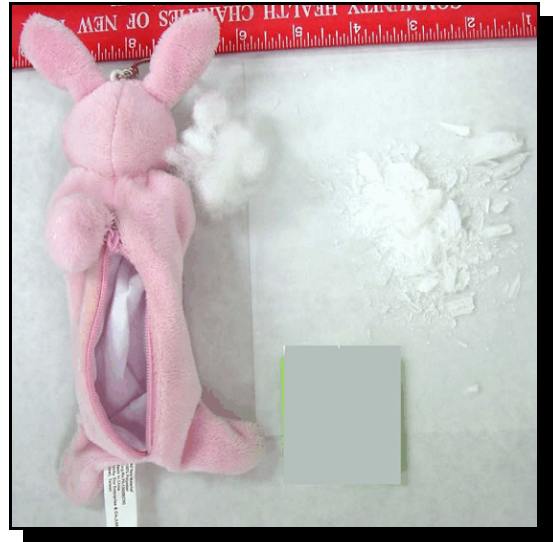
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**- INTELLIGENCE ALERT -**

**“ICE” METHAMPHETAMINE CONCEALED IN A (PRESUMED CHILD’S)  
MINI-PURSE/KEYCHAIN IN NEW YORK CITY**

The DEA Northeast Laboratory (New York, New York) recently received a small pink bunny, apparently a child’s mini-purse and keychain, containing a white crystalline substance, suspected methamphetamine (see Photo 5; note the zipper along the body and the keychain on the top of the head). The exhibit was seized in New York City by agents from the New York Field Division, pursuant to a federal search warrant (details sensitive). Unusually, the material was not packaged, but instead was loose within the purse compartment. Analysis of the material (total net mass 5.1 grams) by GC/FID, GC/MS, and FTIR/ATR confirmed 96.9 percent d-methamphetamine hydrochloride, cut with a small amount of dimethyl sulfone (not quantitated). The Northeast Laboratory routinely receives methamphetamine concealed in various types of containers and packaging, and smuggling in childrens’ toys is fairly common.



**Photo 5**

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**- INTELLIGENCE ALERT -**

**ECSTASY MIMIC TABLETS (CONTAINING HEROIN, COCAINE,  
AND CAFFEINE) IN WASHINGTON, DC**

The DEA Mid-Atlantic Laboratory (Largo, Maryland) recently received 18.5 speckled tan tablets, suspected Ecstasy (see Photo 6). The exhibits were seized in Washington, D.C. by agents from the DEA Washington Division Office, pursuant to a search warrant (no further details). The tablets had no logo, but were beveled. Analysis of the tablets (total net mass 5.1 grams) by color testing (cobalt thiocyanate and Marquis), GC, and GC/MS, however, indicated not MDMA but rather a mixture of heroin (approximately 2 percent), cocaine (approximately 1 percent), and caffeine (not quantitated). This is the first known submission of these type tablets to the Mid-Atlantic Laboratory.



**Photo 6**

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## - INTELLIGENCE ALERT -

### 4-iodo-2,5-dimethoxyamphetamine (DOI) IN MADISON, WISCONSIN

The DEA North Central Laboratory (Chicago, Illinois) recently received a glass bottle containing a clear, colorless, aqueous liquid (pH = 6), purported to contain an analog of DOB (4-bromo-2,5-dimethoxyamphetamine) (no photos). The exhibit was seized by agents from the DEA Madison Resident Office (details sensitive). Analysis of the liquid (total net volume 57.0 milliliters (56.4 grams)) via GC/MS, IR, and LC/MS determined that it contained 4-iodo-2,5-dimethoxyamphetamine hydrochloride (DOI HCl). The solution was not quantitated, but was a moderate concentration based on the GC. No other compounds were detected during the analyses, and the IR of the evaporate gave a good quality match for DOI HCl. This is believed to be the first submission of a solution of DOI to the North Central Laboratory.

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### SELECTED REFERENCES

[Selected references are a compilation of recent publications of presumed interest to forensic chemists. Unless otherwise stated, all listed citations are published in English. Abbreviated mailing address information duplicates that provided by the abstracting service. Patents and Proceedings are reported only by their *Chemical Abstracts* citation number.]

1. Agg KM, Barnett NW, Lewis SW, Pearson JR. **Preliminary investigations into tris(2,2'-bipyridyl) Ruthenium (III) as a chemiluminescent reagent for the detection of 3,6-diacetylmorphine (heroin) on surfaces.** *Journal of Forensic Sciences* 2007;52(5):1111. [Editor's Notes: Presents the use of the title compound in aqueous and anhydrous forms; the anhydrous form gives a fast, bright response. Contact: School of Life and Environmental Sciences, Deakin University, Pigdons Rd., Waurin Ponds, Vic. 3217, Australia.]
2. Bell SEJ, Fido LA, Sirimuthu NMS, Speers SJ, Peters KL, Cosbey SH. **Screening tablets for DOB using surface-enhanced Raman spectroscopy.** *Journal of Forensic Sciences* 2007;52(5):1063. [Editor's Notes: As little as 15 µg can be detected; analysis times are less than 1 minute. Contact: School of Chemistry and Chemical Engineering, Queen's University, Belfast BT9 5AG, U.K.]
3. Fernandez FM, Green MD, Newton PN. **Prevalence and detection of counterfeit pharmaceuticals: A mini review.** *Industrial & Engineering Chemistry Research* 2007, ACS ASAP (no further citation information). [Editor's Notes: A mini-review, discussing new detection tools being developed to identify and characterize fake drugs. Contact: School of Chemistry and Biochemistry, Georgia Institute of Technology, Atlanta, GA 30332.]
4. Izake EL. **Chiral discrimination and enantioselective analysis of drugs: An overview.** *Journal of Pharmaceutical Sciences* 2007;96(7):1659. [Editor's Notes: An overview and review. Contact: Forensic Chemistry Section, Pathology and Scientific Services, Queensland Health, Queensland Government, Australia.]
5. Nguyen DT, Guilleme D, Heinisch S, Barrioulet MP, Rocca JL, Rudaz S, Veuthey JL. **High throughput liquid chromatography with sub-2µm particles at high pressure and high temperature.** *Journal of Chromatography A* 2007;1167(1):76. [Editor's Notes: A repeatability



and stability study (500 injections); 9 doping agents (not identified in the abstract) were analyzed in less than 1 minute; 8 pharmaceuticals (not identified) were analyzed in 40 seconds.].

#### Additional References of Possible Interest:

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2. Mio MJ. **CSI: Detroit - Can pop culture make chemistry relevant to students?** Chimica Oggi 2006;24(2):2. [Editor's Notes: Presents the development of a chemical course based on a TV show that emphasizes forensic science. Contact: Department of Chemistry and Biochemistry, University of Detroit - Mercy, Detroit, MI 48221.]
3. Quest DW, Horsley J. **Field-test of a date-rape drug detection device.** Journal of Analytical Toxicology 2007;31(6):354. [Editor's Notes: For GHB and/or ketamine in beverages. The test accuracy was found to be 100 percent in the laboratory, but considerably less so in the hands of consumers. Contact: College of Nursing, University of Saskatchewan, Saskatoon, Saskatchewan, Canada (no further addressing information was provided).]
4. Ratcliffe LV, Rutten FJM, Barrett DA, Whitmore T, Seymour D, Greenwood C, Aranda-Gonzalvo Y, Robinson S, McCoustra M. **Surface analysis under ambient conditions using plasma-assisted desorption/ionization mass spectrometry.** Analytical Chemistry 2007, ACS ASAP (no further citation information). [Editor's Notes: Presents the title technique, which can analyze drugs (pharmaceutical or "forensic") with no sample prep. Contact: Centre for Analytical Bioscience, School of Pharmacy, Univ. of Nottingham, Nottingham NG7 2RD, U.K.]
5. Ray R, Sharma JD, Limaye SN. **Variations in the physico-chemical parameters of some N-methyl substituted barbiturate derivatives.** Asian Journal of Chemistry 2007;19(5):3382. [Editor's Notes: The specific compounds were not identified in the abstract. Contact: Department of Chemistry and Forensic Science, Dr. H.S. Gour University, Sagar 470 003, India.]
6. Risser D, Uhl A, Oberndorfer F, Honigschnabl S, Stichenwirth M, Hirz R, Sebal D. **Is there a relationship between street heroin purity and drug-related emergencies and/or drug-related deaths?** An analysis from Vienna, Austria. Journal of Forensic Sciences 2007;52(5):1171. [Editor's Notes: Based on statistics from 1999. In contrast to commonly held perceptions, the results indicate no obvious correlations. Contact: Department of Forensic Medicine, Medical University of Vienna, Sensengasse 2, 1090 Vienna, Austria.]

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## SCIENTIFIC MEETINGS

**1. Title: 33rd Annual NEAFS Meeting** (Third and Final Bimonthly Posting)  
**Sponsoring Organization:** Northeastern Association of Forensic Sciences  
**Inclusive Dates:** October 31 - November 3, 2007  
**Location:** Sagamore Resort (Bolton Landing, New York)  
**Contact Information:** Adrian S. Krawczeniuk ([Adrian.S.Krawczeniuk-at-usdoj.gov](mailto:Adrian.S.Krawczeniuk-at-usdoj.gov); 212/620-4923)  
**Website:** [www.neafs.org](http://www.neafs.org)

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# Microgram

## *Bulletin*

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- OCTOBER 2007 -

**- INTELLIGENCE ALERT -**

**ECSTASY MIMIC TABLET (CONTAINING BENZYLPIPERAZINE (BZP), METHAMPHETAMINE, AND CAFFEINE) IN SIKESTON, MISSOURI**

The Missouri State Highway Patrol Troop E Laboratory (Cape Girardeau) recently received one round, green tablet with a poorly defined logo, suspected "Ecstasy" (see Photo 1). The tablet was seized in Sikeston, Missouri by the Sikeston Department of Public Safety (details sensitive; Sikeston is about 150 south of St. Louis). The tablet was 9 millimeters in diameter by 3 millimeters thick, and weighed 290 milligrams. Analysis by color testing (Marquis and Methedrine) and GC/MS, however, indicated not MDMA but rather benzylpiperazine (BZP), methamphetamine, and caffeine in an approximate 300:6:85 ratio (based on the TIC; not formally quantitated). This was the first submission of BZP in any form to the laboratory.



**Photo 1 - Scale in 1/16ths Inch**

[Editor's Notes: The logo may be four "playing card"-type diamonds arranged in a diamond pattern. Informal inquiries suggest that this is a new logo, not previously reported in either

Europe or the U.S. The weight of the tablet (290 milligrams) is rather high for the tablet dimensions (9 x 3 millimeters), but was confirmed by a second weighing, suggesting that it was very highly compressed.]

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### **- INTELLIGENCE ALERT -**

#### **HEROIN SMUGGLED IN A VARIETY OF CANDIES IN QUEENS (NEW YORK)**

The DEA Northeast Laboratory (New York, New York) recently received a multi-part submission of apparent candies, including 82 lollipops, 25 chocolate bars, and 86 caramel squares, all actually containing a compressed brown powder, suspected heroin (see Photos 2 - 4). The exhibits were seized in Queens by agents from the DEA New York Field Division, pursuant to a consent search. Analysis of the powders by color testing (Marquis), GC/MS, GC/FID, and FTIR/ATR confirmed heroin hydrochloride, as follows:

Lollipops (Total net mass 1283 grams): 70 percent heroin hydrochloride, trace cocaine, and aminopyrine (Average length, including the “pop,” was 1.3 inches; average “pop” diameter was 0.4 inch).

Bars (Total net mass 436.9 grams): 65 percent heroin hydrochloride and caffeine (Average dimensions were 2.6 x 1.0 x 0.5 inches).

Squares (Total net mass 468.8 grams): 66 percent heroin hydrochloride and caffeine (Average dimensions were 0.7 x 0.5 x 0.5 inches).

The Northeast Laboratory routinely receives heroin in apparent candies; however, this is the first time a variety of candies was used to transport heroin.



**Photo 2**



**Photo 3**



**Photo 4**

**- INTELLIGENCE ALERT -**

**COCAINE SMUGGLED IN LAMINATED RECIPE SHEETS  
(FROM PERU) IN FT. LAUDERDALE, FLORIDA**

The DEA Southeast Laboratory (Miami, Florida) recently received 20 laminated sheets of cooking recipes, each containing a white powder between the laminated sheets, suspected cocaine (see Photo 5).

The sheets were being shipped in an express mail package from Costa Rica that had originated in Peru, and were seized by Immigration and Customs Enforcement (ICE) personnel at the Ft. Lauderdale Airport. The sheets were approximately 13.5 x 9.5 inches, and were uniformly thin (the powder was finely ground and very evenly distributed). The interior was further lined with a film-like plastic wrap. Analysis of the powder (total net mass 649.6 grams) by color test (Scott's - positive), GC/FID, GC/MS, and FTIR/ATR confirmed 89.7 percent cocaine hydrochloride. This submission was of interest for the unusual concealment technique, not previously seen at the Southeast Laboratory.



**Photo 5 - Color is not true (the powder actually is white).**

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**- INTELLIGENCE ALERT -**

**4-CHLORO-2,5-DIMETHOXYAMPHETAMINE (DOC) IN SANTE FE, NEW MEXICO**

The DEA South Central Laboratory (Dallas, Texas) recently received a small bottle of breath freshening solution containing less than a drop of odorless liquid, suspected to be a solution of LSD (see Photo 6). The bottle was acquired from a cooperating individual by the Federal Bureau of Investigation (FBI)/Santa Fe Office (no further details). Analysis of the liquid residue using GC/MS, however, indicated not LSD but rather 4-chloro-2,5-dimethoxyamphetamine (DOC). The solution was not quantitated, but the loading was low based on the TIC. DOC is not federally controlled; however, it is an analog of 4-bromo-2,5-dimethoxyamphetamine (DOB), which is a Schedule I controlled substance (hallucinogen). The South Central Laboratory has previously received exhibits of DOC.



**Photo 6**

\* \* \* \* \*



**- INTELLIGENCE ALERT -**

**BRICKS OF COCAINE HEAVILY ADULTERATED WITH CREATINE  
IN FALLBROOK, CALIFORNIA**

The DEA Southwest Laboratory (Vista, California) recently received four bricks of compressed, off-white powder, each embossed with a “7” logo, suspected cocaine (see Photo 7). The exhibits were seized by the San Diego County Sheriff’s Department pursuant to a traffic stop on Interstate 15 in Fallbrook, California (approximately 60 miles north of San Diego). Each brick was approximately 9 x 6 x 1.5 inches, and was wrapped in vacuum seal plastic bags, tan tape, and clear plastic. Analysis of the powder (total net mass 4101 grams) by color testing (Scott’s - positive), FTIR, GC/MSD, and HPLC confirmed 13.7 percent cocaine hydrochloride, very heavily adulterated with creatine monohydrate; trace lidocaine was also identified. The creatine was not formally quantitated but was estimated to be approximately 80 percent. This is the first submission of cocaine/creatine bricks to the Southwest Laboratory.

[Editor’s Notes: A search of the *Microgram* archives indicates only one similar case; see: Cocaine with creatine. *Microgram* 2000;33(12):330. In this case (reported by the New York State Police Mid-Hudson Regional Crime Laboratory (Newburgh)), the creatine and cocaine were a heterogeneous mix of white and yellow powders in a plastic bag. The analytical data for creatine has been reported; see: Churchill KT. Creatine - An analytical profile. *Microgram* 2000;33(8):223. Note that both of the above issues (CY 2000) are Law Enforcement Restricted.]



**Photo 7 (Ruler is 6 Inch)**

## SELECTED REFERENCES

[Selected references are a compilation of recent publications of presumed interest to forensic chemists. Unless otherwise stated, all listed citations are published in English. Abbreviated mailing address information duplicates that provided by the abstracting service. Patents and Proceedings are reported only by their *Chemical Abstracts* citation number.]

1. Ko BJ, Suh SI, Suh YJ, In MK, Kim SH. **The impurity characteristics of methamphetamine synthesized by Emde and Nagai method.** *Forensic Science International* 2007;170(2-3):142. [Editor's Notes: 52 samples were analyzed, and characterized based on 5 impurities, resulting in 4 different groups. Contact: Supreme Prosecutor's Office, 706, Banporo, Drug Signature Analysis Center, Seochogu, Seoul 137-730, S. Korea.]
2. Koper C, van den Boom C, Wiarda W, Schrader M, de Joode P, van der Peijl G, Bolck A. **Elemental analysis of 3,4-methylenedioxymethamphetamine (MDMA): A tool to determine the synthesis method and trace links.** *Forensic Science International* 2007;171(2-3):171. [Editor's Notes: 57 powders from clandestine laboratories and 97 tablets from large (>500 tablets) seizures were analyzed by ICP-MS and ICP-AES. The production method was determined for 89 of the 97 tablets (the results for the powders was not reported in the abstract). Contact: Netherlands Forensic Institute, P.O. Box 24044, The Hague 2490 AA, Neth.]
3. Kuwayama K, Inoue H, Kanamori T, Tsujikawa K, Miyaguchi H, Iwata Y, Kamo N, Kishi T. **Contribution of thermal desorption and liquid-liquid extraction for identification and profiling of impurities in methamphetamine by gas chromatography - mass spectrometry.** *Forensic Science International* 2007;171(1):9. [Editor's Notes: Analyses were done with GC/MS. 9 different batches were analyzed. Contact: National Research Institute of Police Science, 6-3-1, Kashiwanoha, Kashiwa, Chiba 277-0882, Japan.]
4. Lingford-Hughes A, Daglish M. **Drugs of abuse.** *Fundamentals of Clinical Psychopharmacology* (3rd Edition) 2006:111. [Editor's Notes: A review. Contact: Psychopharmacology Unit, University of Bristol, Bristol, UK.]
5. Matsuda K, Fukuzawa T, Ishii Y, Yamada H. **Color reaction of 3,4-methylenedioxyamphetamines with chromotropic acid: Its improvement and application to the screening of seized tablets.** *Forensic Toxicology* 2007;25(1):37. [Editor's Notes: For screening of MDA and MDMA in tablets. Contact: Graduate School of Pharmaceutical Sciences, Kyushu University 3-1-1 Maidashi, Higashi-ku, Fukuoka 812-8582, Japan.]

### Additional References of Possible Interest:

1. Charlton MDB, Netti CM, Zoorob ME, Perney NMB, Baumberg JJ. **Organising light on the nano-scale: Surface plasmon engineering for repeatable SERS sensing and applications for trace analyte detection.** *ECS Transactions* 2006;3(11):79. [Editor's Notes: Presents the title technique. Stated applications include trace level detection of illicit drugs. Contact: Mesophotonics Ltd, Southampton, UK SO167NP.]
2. Clelland BL. **Forensic applications of Raman microspectroscopy, capillary electrophoresis, chromatography, and mass spectrometry for the analysis of textile fibers, dyes, illicit drugs, and anticoagulant rodenticides.** (Thesis) *Dissertation Abstracts International*, B 2007;67(9):5041.



3. Cotte-Rodriguez I, Mulligan CC, Cooks RG. **Non-proximate detection of small and large molecules by desorption electrospray ionization and desorption atmospheric pressure chemical ionization mass spectrometry: Instrumentation and applications in forensics, chemistry, and biology.** *Analytical Chemistry* 2007;79(18):7069. [Editor's Notes: Ambient surfaces are examined at distances up to 3 meters from the instrument, without any sample prep. Stated applications include trace level detection of cocaine, heroin, and methamphetamine. LODs were in the low nanogram range. Contact: Department of Chemistry, Purdue University, West Lafayette, IN 47907.]
4. Ebejer KA, Lloyd GR, Brereton RG, Carter JF, Sleeman R. **Factors influencing the contamination of UK banknotes with drugs of abuse.** *Forensic Science International* 2007;171(2-3):165. [Editor's Notes: Banknotes from 8 different regions were analyzed for cocaine, heroin, MDMA, and THC (analytical method(s) not specified in the abstract). The results are discussed. Contact: Building 20F, Golf Course Lane, Mass Spec Analytical Ltd, P.O. Box 77, Filton, Bristol BS99 7AR.]
5. Miller GM, Stripp R. **A study of western pharmaceuticals contained within samples of Chinese herbal/patent medicines collected from New York City's Chinatown.** *Legal Medicine* 2007;9(5):258. [Editor's Notes: 90 representative samples were analyzed by TLC, GC/MS, and HPLC. The identified pharmaceuticals did not include illicit substances. Contact: Dept. of Science, John Jay College of Criminal Justice, 445 West 59th Street, NY, NY 10019.]
6. Petraco N, Ed. **Color Atlas and Manual of Microscopy for Criminalists, Chemists, and Conservators.** CRC Press: Boca Raton, FL (2004).
7. Zipf EC. **Emission detector for the remote detection of explosives and illegal drugs.** (Patent) *Chemical Abstracts* 2007:874282.

\* \* \* \* \*

## THE JOURNAL/TEXTBOOK COLLECTION EXCHANGE

The Journal/Textbook Collection Exchange is a service intended to facilitate the transfer of unwanted journals and textbooks to forensic libraries or other *Microgram* subscribers. At present, this service is offered once a quarter (in January, April, July, and October). The current donations are listed below. The offers are First Come/First Serve (except **libraries have preference**). There are no charges to the requestor. Please provide a full mailing address in the request. **Important!:** Do not provide an address that irradiates mail!

\* Inaba and Cohen. *Uppers, Downers, All Arounders*. 5th Edition (2004). [2 Copies Available.]

\* *Journal of Forensic Sciences*:

1980 - July (#3)

1991 - January (#1), March (#2), May (#3), July (#4), November (#6)

1992 - All

1993 - All, plus an extra copy of January (#1)

1994 - March (#2), May (#3), July (#4)

2003 - January (#1)

2004 - March (#2), July (#4), and November (#6)

2005 - All, plus extra copies of May (#3) and July (#4)

\* *Physician's Desk Reference*, 58th Edition (2004).

**All subscribers are encouraged to donate surplus or unwanted items/collections.** Reference texts and long runs of forensic/analytical journals are of particular interest; however, even single issues are worthwhile. If interested, please consult the *Microgram* website or contact the *Microgram* Editor for further instructions.

The next offering of journals and textbooks will be in the January 2008 issue of *Microgram Bulletin*.

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## THE DEA FY 2008 STATE AND LOCAL FORENSIC CHEMISTS SEMINAR SCHEDULE

The FY 2008 schedule for the DEA's State and Local Forensic Chemists Seminar is as follows:

November 26 - 30, 2007

March 10 - 14, 2008

May 5 - 9, 2008

September 8 - 12, 2008

The school is open only to forensic chemists working for law enforcement agencies, and is intended for chemists who have completed their agency's internal training program and have also been working on the bench for at least one year. There is no tuition charge. The course is held at the AmeriSuites Hotel in Sterling, Virginia (near the Washington/Dulles International Airport). A copy of the application form is reproduced on the last page of the August 2004 issue of *Microgram Bulletin*. (See: <http://www.dea.gov/programs/forensicsci/microgram/mg0804/aug04.pdf>) Completed applications should be mailed to the Special Testing and Research Laboratory (Attention: J. Head) at: 22624 Dulles Summit Court, Dulles, VA 20166. For additional information, call 703/668-3349.

\* \* \* \* \*

## EMPLOYMENT OPPORTUNITIES

Position: **Assistant Drug Chemist and Forensic Drug Chemist** (2 positions).

Location: Hudson County Prosecutor's Office, Forensic Laboratory, Jersey City, NJ.

Salary: Commensurate with Experience.

Application Deadline: Open until Filled.

Duties and responsibilities: The successful candidate will independently carry out examinations of suspected controlled dangerous substances submitted by various law enforcement agencies in connection with criminal investigations and prosecutions using chemical and instrumental analyses. Responsibilities include: Utilize GC/MS and FTIR instruments; interpret chromatographic data; carry out wet chemical analyses; perform peer review of case files; maintain essential laboratory equipment, instruments, records and files; prepare certified laboratory reports; testify in federal, state and municipal courts; and perform other related duties as assigned. The applicant must have the ability to communicate well and work closely with laboratory, legal and administrative personnel; have a working knowledge of computer software, databases and word processing; and have knowledge of Quality Control/Assurance principles.

Qualifications: A minimum of a B.S. degree in forensic science or chemistry or a physical science with at least twenty-four (24) semester hours in chemistry. The ideal candidate will have a minimum of one-year experience analyzing controlled substances.

(Continued Next Page)

Contact: DLT. Roger Forsthoff, Director  
HCPO Forensic Laboratory  
[rforsthoff -at- hcpo.org](mailto:rforsthoff-at-hcpo.org) (201/915-1309)

\* \* \* \* \*

## Microgram Mailing Address Change

Effective October 12, 2007 the address for “hard” mailings to the *Microgram* Editor is:

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8701 Morrisette Drive  
Springfield, VA 22152

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# Microgram

## *Bulletin*

**Published by:**

The Drug Enforcement Administration  
Office of Forensic Sciences  
Washington, DC 20537

The U.S. Attorney General has determined that the publication of this periodical is necessary in the transaction of the public business required by the Department of Justice. Information, instructions, and disclaimers are published in the January issues.

- NOVEMBER 2007 -

## *Microgram Bulletin Turns 40*

Welcome to the 40th Anniversary (and 467th) Issue of *Microgram Bulletin* (formerly known as *Microgram*). This periodical has progressed from a sporadically published paper-based "communication" from the Bureau of Drug Abuse Control and Bureau of Narcotics and Dangerous Drugs (BDAC/BNDD) in late 1967 to electronic posting on [www.dea.gov](http://www.dea.gov) by the DEA Office of Forensic Sciences today. Currently, over 1500 offices around the world receive *Microgram Bulletin*, and the *Microgram* website had over 1.4 million pageviews in CY 2006.

One thing has remained constant over the past 40 years, and that is the commitment of the Office of Forensic Sciences to keep the forensic science and law enforcement communities informed of the latest developments in the production, trafficking, and analysis of abused substances.

A publication of this nature cannot exist for 40 years without the support of its readership. As always, *Microgram Bulletin* and *Microgram Journal* will continue to be dependent on you, the law enforcement and forensic science communities, for the information we publish. I encourage you to

continue to forward items of interest for *Microgram Bulletin* and manuscripts for *Microgram Journal*.

As we move forward into our fifth decade, I want to thank you for your past and continuing support of *Microgram*.

Thomas J. Janovsky  
Deputy Assistant Administrator  
DEA Office of Forensic Sciences

\* \* \* \* \*

### **- INTELLIGENCE ALERT -**

### **VERY LARGE SEIZURE OF LIQUID COCAINE BEING SMUGGLED ON THE ECUADORIAN FISHING BOAT EMPERADOR**

The DEA Special Testing and Research Laboratory (Dulles, Virginia) recently received a small amount of a biphasic liquid suspected to be a mixture of diesel fuel and an aqueous solution of cocaine (see Photo 1). The exhibit was a representative sample taken from approximately 3,850 gallons of liquid seized from a fish-holding tank on an Ecuadorian fishing boat, the *Emperador*, which was apprehended by the U.S. Coast Guard in international waters in the east Pacific Ocean (see Photos 2 - 3, next page). The liquid was estimated to be approximately 2,000 gallons of diesel fuel overlaying approximately 1,850 gallons (7,000 liters) of the aqueous solution. Preliminary testing indicated that the top layer was consistent with diesel fuel. Following standard acid/base workup and chloroform extraction of the aqueous layer, analysis by GC/FID, GC/MS, NMR, and FTIR confirmed cocaine (salt form not determined) at 340 milligrams per milliliter (calculated as the base). This equals approximately 2,380 kilograms of cocaine base total in the seizure. This was the first submission of this type to the Special Testing and Research Laboratory.

[Editor's Notes: The seizure of the *Emperador* was well publicized in the mass media. This is the largest seizure of "liquid cocaine" ever reported to *Microgram*. According to the suspects, the liquid was to be transferred at sea to another vessel, for eventual processing at another, undetermined locale.]



**Photo 1 - Note Lower, Darker Layer**





**Photo 2 - The Emperador**



**Photo 3 - The Fishhold**

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**- INTELLIGENCE ALERT -**

**HEROIN SMUGGLED IN A LARGE, WOODEN-FRAMED PICTURE  
FROM LAGOS, NIGERIA**

The DEA Mid-Atlantic Laboratory (Largo, Maryland) recently received a submission of a large, wooden-framed picture, 24 x 20 x 3/4 inches, containing a sheet of compressed, brown powder, suspected heroin (see Photo 4). The exhibit was seized by German customs agents in Frankfurt, Germany from a flight en route from Lagos, Nigeria to Washington-Dulles airport, and was forwarded to the laboratory after a controlled delivery in the U.S. (no further details). The heroin was wrapped in several layers of plastic and tape, and was concealed behind the picture. Analysis of the powder (total net mass 1,085 grams) by GC/FID, GC/MS, NMR, and FTIR-ATR confirmed 55.9 percent heroin hydrochloride, also containing morphine, codeine, and caffeine (not quantitated). The Mid-Atlantic Laboratory has previously encountered heroin concealed inside picture frames.



**Photo 4**

[Editor's Note: This exhibit was unusual in that the heroin was in a thick sheet mimicking the picture "backing" - not in the wooden frame.]

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**- INTELLIGENCE ALERT -**

**COCAINE SMUGGLED IN DESIGNER BOAT SHOES IN KINGSTON, JAMAICA**

The DEA Mid-Atlantic Laboratory (Largo, Maryland) received three pairs of different color and style “designer”-brand boat shoes, each containing a package of white powder under their insoles, suspected cocaine (see Photo 5). The exhibits were seized by Jamaican authorities from a cruise ship docked at Kingston, and were remanded to the DEA Jamaica Country Office for laboratory analysis. Each package consisted of a plastic bag wrapped with tape. Analysis of the powder (total net mass 2.7 kilograms) by GC/MS, NMR, FTIR-ATR, and GC/FID confirmed 32, 46, and 61 percent cocaine hydrochloride, respectively, all adulterated with nicotinamide (not quantitated).



**Photo 5 - Ruler is 6-Inch**

Although similar exhibits have been submitted to other DEA laboratories, this is believed to be the first submission of this concealment method to the Mid-Atlantic Laboratory.

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**- INTELLIGENCE ALERT -**

**VERY LARGE SEIZURE OF PHARMACEUTICAL GRADE KETAMINE HYDROCHLORIDE IN AURORA, COLORADO**

The DEA Western Laboratory (San Francisco, California) recently received a submission containing three purported pharmaceutical-grade ketamine hydrochloride exhibits, totaling over four kilograms of very fine, fluffy, white powders. The exhibits were seized at a small pharmaceutical firm in Aurora, Colorado by personnel from Immigration and Customs Enforcement and the Food and Drug Administration, and consisted of 30 100-gram bottles, 56 25-gram bottles, and approximately 100 grams of loose powder. The bottles were all factory-sealed and labelled as containing ketamine hydrochloride (e.g., see Photo 6). The loose powder had been taken on-site from two 25 kilogram drums, both also factory-sealed and labelled as containing ketamine hydrochloride. Analysis of the powders by GC/MS, FTIR, and NMR confirmed ketamine hydrochloride in each of the exhibits, all 95 percent or better pure. The drum labels indicated that the material was produced in China. This is one of the largest submissions of ketamine to the DEA Western Laboratory in recent memory.



**Photo 6**

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## SELECTED REFERENCES

[Selected references are a compilation of recent publications of presumed interest to forensic chemists. Unless otherwise stated, all listed citations are published in English. Abbreviated mailing address information duplicates that provided by the abstracting service. Patents and Proceedings are reported only by their *Chemical Abstracts* citation number.]

1. Billault I, Courant F, Pasquereau L, Derrien S, Robins RJ, Naulet N. **Correlation between the synthetic origin of methamphetamine samples and their  $^{15}\text{N}$  and  $^{13}\text{C}$  stable isotope ratios.** *Analytica Chimica Acta* 2007;593(1):20. [Editor's Notes: **Note that the title compound (methamphetamine) does not agree with the content (MDMA).** 45 samples of MDMA were synthesized following the five most common routes using N-precursors from 12 different origins and three different precursors for the aromatic moiety. The  $^{13}\text{C}$  and  $^{15}\text{N}$  contents of both the precursors and the MDMA samples were measured by isotope ratio mass spectrometry coupled to an elemental analyzer (EA-IRMS). The  $\delta$ - $^{15}\text{N}$  values of MDMA are strongly influenced by a combination of the  $\delta$ - $^{15}\text{N}$  values of the source of nitrogen used, the route by which the MDMA is synthesized, and the experimental conditions employed. Contact: Laboratoire d'Analyse Isotopique et Electrochimique de Metabolismes, CNRS UMR6006, University of Nantes, 44322 Nantes, Fr.]
2. Dubois J, Wolff J-C, Warrack JK, Schoppelrei J, Lewis EN. **NIR chemical imaging for counterfeit pharmaceutical products analysis.** *Spectroscopy* 2007;22(Suppl.):36. [Editor's Notes: NIR provides a rapid method for detecting and comparing suspected counterfeit products with no sample preparation. Contact: Malvern Instruments, Analytical Imaging, Columbia, MD (street address and zip code not provided).]
3. Gilmore S, Peakall R, Robertson J. **Organelle DNA haplotypes reflect crop-use characteristics and geographic origins of *Cannabis sativa*.** *Forensic Science International* 2007;172(2-3):179. [Editor's Notes: Comparative sequencing of cannabis individuals across 12 chloroplast and mitochondrial DNA loci revealed 7 polymorphic sites, including 5 length variable regions and 2 single nucleotide polymorphisms. Simple PCR assays were developed to assay these polymorphisms, and organelle DNA haplotypes were obtained for 188 cannabis individuals from 76 separate populations, including drug-type, fiber-type and wild populations. Contact: Centre for Forensic Science, Canberra Institute of Technology, GPO Box 826, Canberra ACT 2601, Australia.]
4. Lee JS, Yang WK, Han EY, Lee SY, Park YH, Lim MA, Chung HS, Park JH. **Monitoring precursor chemicals of methamphetamine through enantiomer profiling.** *Forensic Science International* 2007;173(1):68. [Editor's Notes: Reports the analysis of 416 methamphetamine samples seized in Korea from 1994 to 2005. The samples were derivatized with (S)-(+)-alpha-methoxy-alpha-(trifluoromethyl)phenylacetyl chloride, and the derivatives were analyzed by GC/MS in SIM mode. Most of the seizures were pure S-(+)-enantiomer, but 21% (95 samples) contained the R-(-)-enantiomer above 1%. Contact: National Institute of Scientific Investigation, Department of Narcotics Division, Seoul 158-707, S. Korea.]
5. Madej K, Karabinowska K, Wozniakiewicz M. **Stacking as a method of improvement of the quantification limit of drugs determination by capillary electrophoresis.** *Z Zagadnien Nauk Sadowych* 2006;66:173. [Editor's Notes: A review. Covers pharmaceuticals and drugs of forensic interest (not specified in the abstract). Contact: Institute of Chemistry, Jagiellonian University, Krakow, Pol.]

6. Rowe WF. **Forensic chemistry.** Kirk-Othmer Encyclopedia of Chemical Technology (5th Edition) 2005;12:89. Edited by Seidel, Arza. John Wiley & Sons, Inc.: Hoboken, NJ 978-0-471-48494-3. [Editor's Notes: A review, focusing on criminal investigations. Contact: The George Washington University, Washington, DC (street address and zip code not provided).]
  
7. Soltaninejad K, Faryadi M, Akhgari M, Bahmanabadi L. **Chemical profile of counterfeited buprenorphine vials seized in Tehran, Iran.** Forensic Science International 2007;172(2-3):e4. [Editor's Notes: Analyses of counterfeited buprenorphine by GC/MS and HPLC indicated heroin, acetylcodeine, and pheniramine (but no buprenorphine). Contact: Forensic Toxicology Laboratory, Legal Medicine Organization, Tehran, Iran.]
  
8. Stanaszek R, Zuba D. **1-(3-chlorophenyl)piperazine (mCPP) - A new designer drug that is still a legal substance.** Z Zagadnień Nauk Sadowych 2006;66:220. [Editor's Notes: mCPP in seized tablets, capsules, and powders was analyzed by GC/MS and HPLC. Differentiation between mCPP and para-chlorophenylpiperazine was carried out using UV. Contact: Institute of Forensic Research, Krakow, Pol.]
  
9. Sukrong S, Zhu S, Ruangrunsi N, Phadungcharoen T, Palanuvej C, Komatsu K. **Molecular analysis of the genus Mitragyna existing in Thailand based on rDNA ITS sequences and its application to identify a narcotic species: Mitragyna speciosa.** Biological & Pharmaceutical Bulletin 2007;30(7):1284. [Editor's Notes: The nucleotide sequences of internal transcribed spacers (ITS) and the 5.8S coding region of nuclear ribosomal DNA (rDNA) of the four Mitragyna species were analyzed (M. speciosa, M. hirsuta, M. diversifolia, and M. rotundifolia). This method provides the basis for an effective and accurate identification of M. speciosa (Kratom). Contact: Department of Pharmacognosy, Faculty of Pharmaceutical Sciences, Chulalongkorn University, Bangkok 10330, Thailand.]
  
10. Zhu E-Y, Lin Y, Zhuang Z-Y. **Partial least squares variable selection method and its application in drug source analysis.** Fenxi Huaxue 2007;35(7):973. [Editor's Notes: Presents the data analysis of 244 heroin samples that were analyzed by ICP-MS. This article is written in Chinese. Contact: Department of Chemistry and the Key Laboratory of Analytical Science of the Ministry of Education, College of Chemistry and Chemical Engineering, Xiamen University, Xiamen, Peop. Rep. China 361005.]

#### **Additional References of Possible Interest:**

1. Gaines RB, Frysinger GS, Reddy CM, Nelson RK. **Comprehensive two-dimensional gas chromatography (GC×GC) in environmental forensics.** Preprints of Extended Abstracts presented at the ACS National Meeting, American Chemical Society, Division of Environmental Chemistry 2007;47(2):530. [Editor's Notes: Presents a new technique for the analysis of environmental samples containing complex mixtures of organic compounds. The instrument can also be interfaced with a mass spectrometer. Contact: Dept. Science, U.S. Coast Guard Academy, New London, CT 06320.]
  
2. Perz RC, Sproll C, Lachenmeier DW, Buschmann R. **Opiate alkaloids in poppy seeds - A consequence of globalization of trade?** Deutsche Lebensmittel-Rundschau 2007;103(5):193. [Editor's Notes: A survey and discussion. This article is written in German. Contact: Chemisches und Veterinäruntersuchungsamt (CVUA) Stuttgart, D-70736 Fellbach, Germany.]

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## EMPLOYMENT OPPORTUNITIES

Position: **Assistant Drug Chemist and Forensic Drug Chemist** (2 positions). (Second Posting)  
Location: Hudson County Prosecutor's Office, Forensic Laboratory, Jersey City, NJ.  
Salary: Commensurate with Experience.  
Application Deadline: Open until Filled.

Duties and responsibilities: The successful candidate will independently carry out examinations of suspected controlled dangerous substances submitted by various law enforcement agencies in connection with criminal investigations and prosecutions using chemical and instrumental analyses. Responsibilities include: Utilize GC/MS and FTIR instruments; interpret chromatographic data; carry out wet chemical analyses; perform peer review of case files; maintain essential laboratory equipment, instruments, records and files; prepare certified laboratory reports; testify in federal, state and municipal courts; and perform other related duties as assigned. The applicant must have the ability to communicate well and work closely with laboratory, legal and administrative personnel; have a working knowledge of computer software, databases and word processing; and have knowledge of Quality Control/Assurance principles.

Qualifications: A minimum of a B.S. degree in forensic science or chemistry or a physical science with at least twenty-four (24) semester hours in chemistry. The ideal candidate will have a minimum of one-year experience analyzing controlled substances.

Contact: DLT. Roger Forsthoff, Director  
HCPO Forensic Laboratory  
[rforsthoff-at-hcpo.org](mailto:rforsthoff-at-hcpo.org) (201/915-1309)

\* \* \* \* \*

### Microgram Surface Mail Address Change

Effective October 12th, 2007 the address for "hard" mailings to the *Microgram* Editor was changed to:

DEA Headquarters  
Attn: Office of Forensic Sciences/Microgram Editor  
8701 Morrisette Drive  
Springfield, VA 22152

\* \* \* \* \*

### Microgram email Address Change

Effective January 1st, 2008 the email address for the *Microgram* Editor will be:

[DEA-Microgram-2008-at-mailsnare.net](mailto:DEA-Microgram-2008-at-mailsnare.net)

The current email address ( [microgram-2007-at-mailsnare.net](mailto:microgram-2007-at-mailsnare.net) ) will be monitored until January 31st, 2008. An automated response will direct senders to the new address.

\* \* \* \* \*

## UPDATED EMAIL ADDRESSES NEEDED

The email addresses for the following organizations returned rejection notices to the *Microgram* sending address for at least the past three issues of *Microgram Bulletin*, and therefore the respective organizations have been dropped from the subscription list. Note that the errors include “mailbox full,” “over quota,” “user not found,” or “user unknown” messages, and also a variety of anti-spam/filtering messages (the latter resulting from failure to “whitelist” the *Microgram* sending address). The Editor requests your assistance in contacting these organizations, determining if they wish to remain on the subscription e-net, and if so asking them to forward a valid email address to the *Microgram* sending address. In addition, if the Office is closed or is no longer interested, please forward that information.

### **U.S. Subscribers (by State, except U.S. Government organizations):**

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**Arizona** - Arizona Department of Public Safety - State Gang Task Force/Bullhead City;

**Arkansas** - Baxter County Sheriff's Office/Mountain Home;

**California** - Bakersfield Police Department - Crime Laboratory/Bakersfield; California Department of Justice - Santa Barbara Laboratory/Santa Barbara; Huntington Beach Police Department - Crime Laboratory/Huntington Beach; Manteca Police Department/Manteca; San Bernardino County Sheriff - Scientific Investigations Unit/San Bernardino; Ventura County Sheriff's Department - Forensic Science Laboratory/Ventura;

**Colorado** - Grand Junction Police Department Laboratory/Grand Junction; Western Forensic Law Enforcement Training Center - Colorado State University/Pueblo;

**Connecticut** - Connecticut Dept of Public Safety - Meriden Laboratory/Meriden;

**Delaware** - Delaware Office of the Chief Medical Examiner - Forensic Sciences Laboratory/Wilmington; Delaware State Police - Crime Laboratory/Dover;

**Florida** - Manatee County Sheriff's Office/Bradenton; Pinellas County Forensic Laboratory/Largo; Pinellas County Sheriff's Office - Narcotics Division/Largo;

**Georgia** - Albany State University - Criminal Justice Department - Forensic Sciences/Albany; Northwestern Technical College - Department of Criminal Justice/Rock Spring;

**Illinois** - Illinois State Police - Southern Illinois Forensic Science Center/Carbondale; Northeastern Illinois Regional Crime Laboratory/Vernon Hills;

**Indiana** - Indianapolis-Marion County Forensic Services Agency/Indianapolis;

**Louisiana** - Acadiana Criminalistics Laboratory/New Iberia;

**Maine** - Portland Police Bureau - Drugs and Vice Division/Portland;

**Massachusetts** - Massachusetts Department of State Police - Western Satellite Laboratory/Springfield; Massachusetts Department of State Police - North East Satellite Laboratory/Danvers;

**Mississippi** - University of Mississippi - Department of Chemistry - Forensics Program/University;  
University of Southern Mississippi - Forensic Science Minor Program/Hattiesburg;

**Missouri** - Jefferson College - Police Training Program/Hillsboro;

**Nebraska** - Fairbury Police Department/Fairbury;

**New Jersey** - Newark Police Department/Newark; Ocean County Sheriff's Department/Tom's River;  
Union County Prosecutor's Office/Westfield;

**New Mexico** - College of the Southwest - Carlsbad - Criminal Justice Department/Carlsbad; New  
Mexico Department of Health - Scientific Laboratory Division - Toxicology/Albuquerque;  
Albuquerque Police Department/Albuquerque;

**New York** - International Narcotics Enforcement Officer's Association/Albany; Nassau County Medical  
Examiner's Office - Toxicology Laboratory/East Meadow; Onondaga County District Attorney's  
Office/Syracuse; Pace University - Department of Chemistry and Physical Sciences/New York;  
Ulster Correctional Facility/Napanoch; Westchester County Department of Laboratories/Valhalla;

**North Carolina** - Forsyth County Sheriff's Office Crime Laboratory/Winston-Salem;

**Ohio** - Cuyahoga County Coroner's Office/Cleveland; Defiance College - Department of Chemistry and  
Forensics/Defiance; Newark Police Department Forensic Services/Newark;

**Oklahoma** - Broken Arrow Police Department Crime Laboratory/Broken Arrow; Midwest City Police  
Department/Midwest City; Oklahoma State Bureau of Investigation - Central  
Laboratory/Oklahoma City; Oklahoma State Bureau of Investigation - Regional  
Laboratory/Edmond; Oklahoma State Bureau of Investigation - Regional Laboratory/Enid; Ponca  
City Police Department/Ponca City;

**Pennsylvania** - Waynesburg College - Forensic Science Program/Waynesburg; West Chester  
University - Department of Chemistry (Forensic Science Program)/West Chester;

**South Carolina** - Aiken County Sheriff's Office Regional Forensics Laboratory/Aiken; Law  
Enforcement Center Crime Laboratory/Greenville; South Carolina Department of Corrections -  
K9 Drug Interdiction Unit/Colombia;

**Texas** - Bexar County Forensic Science Center/San Antonio; Dallas ISD Police Department/Dallas;  
Harris County Court Liaison Officer/Houston; Tarrant County Medical Examiner's Office -  
Toxicology Laboratory/Fort Worth;

**Utah** - Utah Department of Public Safety - Central Utah Criminalistics Laboratory/Salt Lake City;

**Virginia** - Chesapeake Police Department/Chesapeake;

**Washington (State)** - Eastern Washington University - Forensic Sciences Program/Cheney; Lakewood  
Police Department/Lakewood; Seattle Police Department Crime Laboratory/Seattle;

**Washington, DC** - Europol (Attaches);

**West Virginia** - West Virginia State Police Crime Laboratory/South Charleston.



**U.S. Government (by Agency):**

**Bureau of Alcohol, Tobacco, and Firearms** - National Laboratory Center/Rockville, MD; Regional Laboratory/Atlanta, GA;

**Federal Bureau of Investigation** - Laboratory/Washington, DC;

**Naval Criminal Investigative Service** - FEYK; HQs/Washington, DC; Regional Forensic Laboratory/Norfolk, VA; Regional Forensic Laboratory/San Diego, CA;

**U.S. Army** - Criminal Investigations Laboratory/Fort Park, GA;

**U.S. Attorney's Office** - Lafayette, LA;

**U.S. Customs Service** - Research Laboratory/Springfield, VA; San Juan Laboratory/San Juan, PR.

**U.S. Fish and Wildlife Service** - Lacey, WA;

**International Subscribers (by Country):**

**Australia** - New South Wales Police - Forensic Science Laboratory/Westmead, NSW;

**Belgium** - Scientific Institute of Public Health/Brussels;

**Colombia** - Departamento Administrativo de Seguridad/Bogota;

**West Indies** - Forensic Science Centre/St. Michael, Barbados.

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# Microgram

## *Bulletin*

**Published by:**

The Drug Enforcement Administration  
Office of Forensic Sciences  
Washington, DC 20537

The U.S. Attorney General has determined that the publication of this periodical is necessary in the transaction of the public business required by the Department of Justice. Information, instructions, and disclaimers are published in the January issues.

- DECEMBER 2007 -

- INTELLIGENCE ALERT -

### **SMALL HEROIN DISKS NEAR GREENSBORO, GEORGIA**

The Georgia Bureau of Investigation, Division of Forensic Sciences, Headquarters Laboratory (Atlanta) recently received five small discs of compacted, reddish-brown powder, suspected heroin (see Photo 1). The exhibits were seized near Greensboro by the Greene County Sheriff's Office, pursuant to a local traffic stop (Greensboro is about 75 miles east of Atlanta). The discs were approximately 9 centimeters in diameter and between 1.5 and 4.5 centimeters thick. Analysis of the powder (total net mass 594 grams) by UV/VIS, HPLC, and GC/MS confirmed heroin (not quantitated), hydroxyzine, caffeine, O6-monoacetylmorphine, lidocaine, diphenhydramine, and procaine in a 40 : 34 : 29 : 22 : 14 : 2.5 : 1 ratio; aspirin and phenacetin were also identified. This is the first known submission of heroin in this unusual form, and also with such an unusual mix of adulterants, to the laboratory.



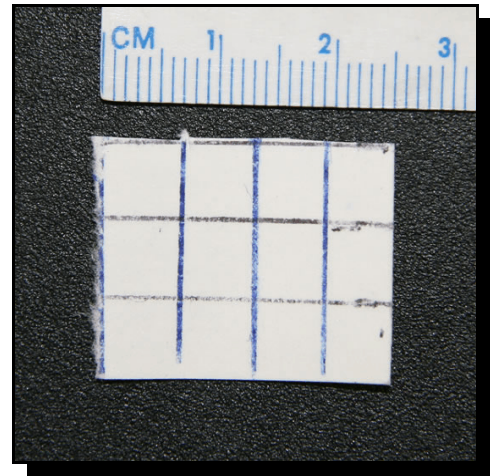
**Photo 1**

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**- INTELLIGENCE ALERT -**

**LSD BLOTTER ACID MIMICS CONTAINING 4-CHLORO-2,5-DIMETHOXY-AMPHETAMINE (DOC) IN CONCORD, CALIFORNIA**

The Contra Costa County Sheriff - Coroner's Office Forensic Services Division Laboratory (Martinez, California) recently received a small piece of crudely lined white blotter paper without any design, suspected LSD "blotter acid" (see Photo 2). The exhibit was seized in Concord by the Concord Police Department, pursuant to a local arrest for possession for sale (no further details). Unusually, the paper appeared to be hand-lined using two pens, in squares measuring approximately 6 x 6 millimeters. The paper displayed fluorescence when irradiated at 365 nanometers; however, color testing for LSD with *para*-dimethylaminobenzaldehyde (PDMAB) was negative. Analysis of a methanol extract by GC/MS indicated not LSD but rather 4-chloro-2,5-dimethoxy-amphetamine (DOC, not quantitated but a high loading based on the TIC). This was the laboratory's first encounter with DOC in any form.



**Photo 2**

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**- INTELLIGENCE ALERT -**

**RECENT, UNUSUAL DRUG SUBMISSIONS IN NEW ZEALAND**

The Drugs Group at ESR (the National Forensic Laboratory located in Auckland) reports receiving the following unusual cases during the second quarter of CY 2007 (photos not available):

- A) Heroin that resembled bread crumbs;
- B) LSD blotter acid mimics actually containing 2,5-dimethoxy-4-iodophenethylamine (2C-I);
- C) Powders (alleged methamphetamine) that were apparently crushed rock salt containing only trace methamphetamine;
- D) An off-white powder (62 grams) identified as morpholine;
- E) Blue Ecstasy mimic tablets (Playboy Bunny logo) actually containing a mixture of diphenylprolinol and benzophenone, along with traces of BZP and TFMPP;
- F) Green Ecstasy mimic tablet (raised star logo) actually containing a mixture of methylone, fluorophenylpiperazine, paracetamol, caffeine, diphenhydramine, and dextromethorphan;
- G) Crystal methamphetamine in hair dryers;
- H) 4.5 liters of a green liquid identified as 10 percent hash oil in isopropanol (hash oil solutions in New Zealand are normally about 1 percent concentration);
- I) A powder identified as dimethylamphetamine;
- J) A brown powder identified as a mixture of BZP, fluorophenylpiperazine, and methylone; and
- K) Two powders (13.4 and 9.6 grams) identified as a mixture of paracetamol and atenolol.

**- INTELLIGENCE ALERT -**

**POOR QUALITY METHAMPHETAMINE CONTAINING TRACE CLOBENZOREX  
IN PHOENIX, ARIZONA**

The Phoenix (Arizona) Police Department Laboratory Services Bureau recently received 10 plastic bags, each containing a brown crystalline substance that appeared to be damp or oily, purported methamphetamine (see Photo 3). The exhibits were seized by U.S. Probation Officers pursuant to a consent search of a rental truck, and subsequently turned over to Phoenix Police. The suspect in the case had voluntarily driven the truck to his probation office, and indicated that the exhibits were part of a much larger quantity (allegedly 27 pounds) that he and a roommate had discovered in an abandoned self-storage unit that they had won in an auction (location not provided). A variety of other methamphetamine processing chemicals were also alleged to be present in the storage unit (no further details). Analysis of the substance (total net mass 479 grams in 10 bags) by color testing (Marquis: Very weak orange color (difficult to discern); nitroprusside: Slow blue color) and microcrystalline testing (gold chloride: A few distorted crystals) were inconclusive. Following basic workup, analysis of an ether extract by GC/MS confirmed methamphetamine (not quantitated, but a rather low concentration) adulterated with trace clobenzorex ((+)-N-(o-chlorobenzyl)- $\alpha$ -methylphenethylamine), a diet drug that is banned for use in the U.S. The cutting agent that made up most of the sample was not identified, but was consistent with dimethylsulfone. This was the laboratory's first encounter with an exhibit of this type.



**Photo 3**

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**- INTELLIGENCE ALERT -**

**DIMETHYLSULFONE CONTAINING LOW CONCENTRATIONS OF FENTANYL  
IN MOHAVE COUNTY, ARIZONA**

The Arizona Department of Public Safety - Western Regional Crime Laboratory (Lake Havasu City) recently received three small baggies each containing a white crystalline substance (combined total net mass 7.22 grams) and one large bag containing a crystalline substance with a slight greenish tint (total net mass 205.83 grams), all suspected methamphetamine (no photos). The exhibits were seized by the Ft. Mojave Tribal Police from a residence near Bullhead City (Mohave County). The materials gave no response to standard color tests. Analysis by FTIR indicated only dimethylsulfone. Following acid/base workup, analyses of concentrated hexane and methanol extracts of all subexhibits by color testing (Marquis: Weak orange; nitroprusside: No response), GC/MS, and UV confirmed fentanyl (not quantified, but a low concentration based on the TIC). It is unknown why the large subexhibit had a greenish tint. This was the laboratory's first encounter with dimethylsulfone containing fentanyl.



**- INTELLIGENCE ALERT -**

**COCAINE BRICKS CONTAINING GLASS MARBLES  
ON THE SOUTHWEST BORDER**

The DEA Southwest Laboratory (Vista, California) recently received two separate exhibits of kilogram bricks of compressed, off-white powder, suspected cocaine. The first exhibit consisted of 3 bricks, which were seized by Immigration and Customs Enforcement (ICE) personnel from a vehicle entering at the Tecate Port of Entry (POE); each brick was packaged in heat-sealed plastic, tan tape, black carbon paper, cellophane, yellow grease, a second layer of cellophane, and a second layer of black carbon paper. The second exhibit consisted of 20 bricks, which were seized by ICE personnel from a vehicle entering at the San Ysidro POE; each brick was packaged in heat-sealed plastic, black latex, cellophane, tan tape, black grease, clear tape, dryer sheets, and a second layer of cellophane. Analysis of the first seizure by FTIR, GC/MSD, and HPLC confirmed 83.3 percent cocaine hydrochloride. One of the bricks in this seizure had a logo of three joined rings with three adjacent stars (see Photo 4), and was found to contain a single half-dome shaped glass marble, 15 millimeters in diameter (see Photo 5; not weighed). Analysis of the second seizure (same techniques) confirmed 92.0 percent cocaine hydrochloride. Two of the bricks in this seizure had a stylized “TURBO” logo (see Photo 6), and were each found to contain a single round glass marble, 15 millimeters in diameter, both with a mirror finish (see Photo 7; the net mass of each marble was 5.4 grams). The purpose of the marbles is unknown; however, since three bricks in two unrelated seizures were found to contain these unusual objects, it is unlikely that their inclusion was accidental. These were the first ever submissions of cocaine bricks to the Southwest Laboratory that were found to contain foreign objects of any type.



**Photo 4**



**Photo 6**



**Photo 5**



**Photo 7**

**- INTELLIGENCE ALERT -**

**FENTANYL IN LACTOSE IN ALBUQUERQUE, NEW MEXICO**

The DEA South Central Laboratory (Dallas, Texas) recently received two plastic bags of off-white powder that did not field test positive for any common drugs (see Photo 8). The exhibit was seized by agents from the DEA El Paso Field Division pursuant to a search of an individual at the Albuquerque, New Mexico, train station (no further



**Photo 8**

details). Analysis of the powder (total net mass 1.75 kilograms) by GC/MS, NMR, FTIR/ATR, and HPLC indicated 3.4 percent fentanyl hydrochloride cut with lactose. This is the largest exhibit of fentanyl hydrochloride ever submitted to the South Central Laboratory.

[Editor's Note: A similar exhibit (9.8 percent fentanyl cut with lactose) was recently reported by the DEA Southwest Laboratory; see: Microgram Bulletin 2007;40(4):41.]

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**- INTELLIGENCE ALERT -**

**COCAINE IN FALSE BOTTOM, DOUBLE-WALLED METAL BUCKETS  
IN FORT LAUDERDALE, FLORIDA**

The DEA Southeast Laboratory (Miami, Florida) recently received seven double-walled, metal buckets, each with false bottoms containing a package of white powder, suspected cocaine (see Photo 9). The exhibits were seized by Customs and Border Protection personnel from the checked luggage of a passenger arriving at the Fort Lauderdale International Airport on a flight from Haiti. The powders were in plastic bags that were wrapped in carbon paper. The false bottoms were fabricated by sealing an inner metal lining to the outer bucket with what appeared to be a fiberglass resin, creating a one inch space. Analysis of the powder (total net mass 2,989 grams) by GC/MS, FTIR and GC/FID confirmed 78.1 percent cocaine hydrochloride. This is the first submission of attempted smuggling in a double-walled bucket to the Southeast Laboratory.



**Photo 9**



## - INTELLIGENCE ALERT -

### HEROIN CONCEALED IN CIGARS IN SAN JUAN, PUERTO RICO

The DEA Northeast Laboratory (New York, New York) recently received 33 cigars that were individually sealed in cellophane sleeves and five plastic syringe bodies each containing a tan colored powder, suspected heroin (see Photo10). Upon opening and disassembly, 31 of the cigars also contained plastic syringe bodies containing the tan colored powder, while two contained plastic syringes containing an unknown white powder. The exhibits were originally seized by Immigration and Customs Enforcement (ICE) personnel at the International Airport in San Juan, Puerto Rico. The original five syringe bodies had been removed from cigars by ICE personnel prior to submission. The cigars (and sleeves) had no brand markings; the syringes appeared to be melted shut on their needle ends and were plugged with a small rubber stopper on their plunger ends. Analysis of the tan colored powder (total net mass 370.8 grams in 36 syringes) by GC/FID, GC/MS, LC/MS, and FTIR/ATR, confirmed 68 percent heroin hydrochloride, adulterated with lidocaine and thiamine (not quantitated). Analysis of the white powder in the two syringes (total net mass 16.3 grams) by GC/MS and FTIR/ATR indicated only aspirin. The Northeast Laboratory routinely receives heroin smuggled in various types of containers and packaging; however, this is the first known submission of heroin concealed in cigars.



Photo 10

\* \* \* \* \*

### SELECTED REFERENCES

[The Selected References section is a compilation of recent publications of presumed interest to forensic chemists. Unless otherwise stated, all listed citations are published in English. Abbreviated mailing address information duplicates that provided by the abstracting service. Patents and Proceedings are reported only by their *Chemical Abstracts* citation number.]

1. Adamczyk A, Sadakierska-Chudy A, Janoszka J, Rymkiewicz A, Dobosz T. **Hallucinogenic fungi (psilocybe). Part II. Identification of Psilocybe semilanceata by PCR.** Arch Med Sadowej Kryminologia 2007;57(3):285. [Editor's Notes: Presents the title study. This article is written in Polish. Contact: Z Katedry Medycyny Sadowej i Zakladu Technik Molekularnych Akademii Medycznej we Wroclawiu Kierownik: dr hab. T. Dobosz, Poland.]

2. Agg KM, Barnett NW, Lewis SW, Pearson JR. **Preliminary investigations into tris(2,2'-bipyridyl) ruthenium (III) as a chemiluminescent reagent for the detection of 3,6-diacetylmorphine (heroin) on surfaces.** Journal of Forensic Sciences 2007;52(5):1111. [Editor's Notes: The use of tris(2,2'-bipyridyl) ruthenium (III) as chemiluminescent spray reagent spot-test for heroin is discussed. Two forms of the reagent (aqueous versus anhydrous) were investigated and found to give very different results. The aqueous reagent gave a slow, low intensity chemiluminescence, while the anhydrous reagent gave a fast, bright response in the presence of heroin. However, the anhydrous reagent is less sensitive. Contact: School of Life and Environmental Sciences, Deakin University, Geelong, Vic., Australia.]
  
3. Bones J, Thomas KV, Paull B. **Using environmental analytical data to estimate levels of community consumption of illicit drugs and abused pharmaceuticals.** Journal of Environmental Monitoring 2007;9(7):701. [Editor's Notes: A solid phase extraction method and LC/MS-MS was used for the determination of illicit drugs and abused pharmaceuticals in treated wastewater and surface water samples at the ng L-1 level. The procedure was used to determine the chosen analytes in wastewater treatment plants in Dublin, Ireland and surrounding suburbs. Cocaine was detected in 70% of the collected samples in the range of 25 - 489 ng L-1, and benzoylecgonine in the range of 22 - 290 ng L-1. Other substances detected included morphine, Temazepam and the primary metabolite of methadone. Contact: National Centre for Sensor Research, School of Chemical Science, Dublin City University, Dublin, Ire.]
  
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5. Bouchonnet S, Kinani S, Sablier M, Pirnay S. **In situ chemical ionization in ion trap mass spectrometry - The beneficial influence of isobutane as a reagent gas.** European Journal of Mass Spectrometry 2007;13(3):227. [Editor's Notes: Same four substrates (see preceding citation). Contact: Departement de Chimie des Mecanismes Reactionnels, Ecole Polytechnique, Route de Saclay, 91128 Palaiseau Cedex, France.]
  
6. Cook E, Fong R, Horrocks J, Wilkinson D, Speller R. **Energy dispersive X-ray diffraction as a means to identify illicit materials: A preliminary optimization study.** Applied Radiation and Isotopes 2007;65(8):959. [Editor's Notes: Presents the use of energy dispersive x-ray diffraction as a nondestructive method to rapidly identify illicit drugs in parcels. Seven illicit drug samples and a possible cutting agent were analyzed, and the results used to calibrate and train software to predict drug content in previously unseen spectra. Contact: Department of Medical Physics and Bioengineering, UCL, London, UK WC1E 6BT.]
  
7. Deng C, Zhang L, Guo H. **Nucleophilic addition of N-methylhydroxylamine and O-methylhydroxylamine to 2-nitryl-1-phenylpropene.** Wujing Yixueyuan Xuebao 2006;15(4):308. [Editor's Notes: The title duplicates that provided by the abstracting service; it appears likely that the actual title compound is 2-nitro-1-phenylpropene. The title study is presented. The products were isolated by HPLC, and their structures were verified by 1H-NMR. The yield of products implied that the nucleophilic addition of N-methylhydroxylamine to unsaturated nitro compounds gave stereoselectivity. This article is written in Chinese. Contact: Department of Continuing Education, Medical College of Chinese People's Armed Police Force, Tianjin 300162, Peop. Rep. China.]

8. Fierro I, Deban L, Pardo R, Tascon M, Vazquez D. **Analysis of heavy metals in ecstasy tablets by electrochemical methods.** *Toxicological and Environmental Chemistry* 2007;89(3):411. [Editor's Notes: Trace heavy metals were analyzed by electrochemical techniques in Ecstasy tablets obtained from 9 different police seizures made in Spain. Lead, cadmium, copper, and zinc were determined by differential pulse anodic stripping voltammetry at a hanging mercury drop electrode, whereas nickel and cobalt were determined by adsorptive differential pulse cathodic stripping voltammetry from their dimethylglyoxime complexes. The results were compared with electrothermal atomic absorption spectrometry. Contact: Departamento de Quimica Analitica, Facultad de Ciencias, Universidad de Valladolid, Valladolid 470005, Spain.]
9. Lasmar MC, Leite EMA. **Development and validation of a gas chromatography method for the determination of ecstasy and amphetamine derivatives in tablets.** *Revista Brasileira de Ciencias Farmaceuticas* 2007;43(2):223. [Editor's Notes: Uses GC/FID for analysis of MDMA, MDA, and MDEA in tablets. This article is written in Portuguese. Contact: Setor de Toxicologia, Departamento de Analises Clinicas e Toxicologicas, Faculdade de Farmacia, Universidade Federal de Minas Gerais, Brazil.]
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11. Rosner P, Junge T, Westphal F, Fritschi G. *Mass Spectra of Designer Drugs, Including Drugs, Chemical Warfare Agents, and Precursors*, Volume 1-2, Wiley-VCH Verlag GmbH Co. KGaA: Weinheim, 2007. [Reference Text - See Journal of the American Chemical Society 2007;129(38):11873.]
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13. Sanderson K. **Opiates for the masses.** *Nature* 2007;449(7160):268. [Editor's Notes: A conversational overview, focusing on the current situation in Afghanistan. Contact: No contact information was provided.]
14. Takekawa K, Ohmori T, Kido A, Oya M. **Methamphetamine body packer: Acute poisoning death due to massive leaking of methamphetamine.** *Journal of Forensic Sciences* 2007;52(5):1219. [Editor's Notes: Three body packers were involved; one died. Impurity-profiling analysis of the seized methamphetamine (technique(s) not reported in the abstract) indicated that all three batches originated from the same source. Contact: Forensic Science Laboratory, Yamanashi Prefectural Police Headquarters 312-4 Kubonakajima, Isawa, Fuefuki-shi, Yamanashi 406-0036, Japan.]

15. Wan Z, Wan Z. **Test paper comprising colloidal gold-labeled and immobilized antibodies for rapid determination of phenacyclidine.** (Patent) Chemical Abstracts 2007;147:380999e.
16. Wan Z, Wan Z. **Test paper comprising colloidal gold-labeled mouse monoclonal antibody and immobilized goat anti-mouse IgG polyclonal antibodies for detn. of amphetamine.** (Patent) Chemical Abstracts 2007;147:381000j.
17. Wang G, Shen J, Jia Y. **Vibrational spectra of ketamine hydrochloride and 3,4-methylenedioxymethamphetamine in terahertz range.** Journal of Applied Physics 2007;102(1):013106/1. [Editor's Notes: The results suggest that the use of the terahertz TDS technique can be an effective method for the detection of illicit drugs. Contact: Department of Physics, Capital Normal University, Beijing, Peop. Rep. China 100037.]
18. Witter RZ, Martyny JW, Mueller K, Gottschall B, Newman LS. **Symptoms experienced by law enforcement personnel during methamphetamine lab investigations.** Journal of Occupational and Environmental Hygiene 2007;4:895. [Editor's Notes: Based on responses (# = 240) to a standardized, self-administered survey. Includes extensive discussion. Contact: National Jewish Medical and Research Center, Division of Environmental and Occupational Health Sciences, 1400 Jackson St., Denver, CO 80206.]
19. Yang J, Bian, S-z. **A reviewing for abusing of ketamine.** Fayixue Zazhi 2007;23(4):312. [Editor's Notes: The title duplicates that provided by the abstracting service; it appears likely it should be "A review of ketamine abuse" or similar. Presents a review of the pharmacology and toxicology of ketamine, and the methods for its detection. This article is written in Chinese. Contact: Department of Forensic Medicine, Medical School of Soochow University, Suzhou 215123, Peop. Rep. China.]

#### **Additional References of Possible Interest:**

1. Anonymous. **WHO expert committee on specifications for pharmaceutical preparations.** World Health Organization Technical Report Series 2006;937(i-x):1. [Editor's Notes: A review, presenting the recommendations of an international group of experts convened by the World Health Organization (WHO) to consider matters concerning the quality assurance of pharmaceuticals and specifications for drug substances and dosage forms. Contact: World Health Organization, Geneva, Switz. (no further addressing information was provided).]
2. Anonymous. **WHO expert committee on specifications for pharmaceutical preparations.** World Health Organization Technical Report Series 2007;943(i-xi):1. [Editor's Notes: A review, presenting the recommendations provided by the World Health Organization (WHO) Expert Committee to help national and regional authorities (in particular drug regulatory authorities) and procurement agencies, as well as major international bodies and institutions, such as the Global Fund, and international organizations such as UNICEF, to combat problems of counterfeit and substandard medicines. Contact: WHO Expert Committee, Switz. (no further addressing information was provided).]
3. Eliasson C, Matousek P. **Spatial offset broadens applications for Raman spectroscopy.** Laser Focus World 2007;43(5):123. [Editor's Notes: A review, covering the detection of counterfeit drugs and the security screening of envelopes. Contact: CCLRC Rutherford Appleton Laboratory, Central Laser Facility, Didcot, Oxfordshire, UK OX11 0QX.]

4. Huhn C. **Optimization of Sample Injection and Separation Using Capillary Electrophoresis, Micellar Electrokinetic Chromatography and the Column-Coupling Isotachophoresis-Capillary Electrophoresis for the Analysis of Complex Samples in Forensic Science.** (Dissertation) Chemical Abstracts 2007:1192562.
5. Mukhopadhyay R. **Out! Catching Doping Athletes.** Analytical Chemistry 2007;79(15):5522. [Editor's Notes: A review of sports doping by athletes and the methods used to detect performance enhancing drugs. Contact: USA (no further information was provided).]

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## EMPLOYMENT OPPORTUNITIES

1) The DEA Office of Forensic Sciences has posted the following chemist vacancy announcements:

Four (4) Chemist positions, DEA Mid-Atlantic Laboratory (Largo, Maryland); Job Announcement Number: F-DEA-MIDATL-08-0012-DEU

Three (3) Chemist positions, DEA Western Laboratory (San Francisco, California); Job Announcement Number: F-DEA-WEST-08-0014-DEU

Each announcement is posted on [www.usajobs.gov](http://www.usajobs.gov) and **will close on January 4, 2008**. If you have any questions, please call the Office of Forensic Sciences at: 202-307-3635.

\* \* \* \* \*

2) Position: **Assistant Drug Chemist and Forensic Drug Chemist** (Third and Final Posting)  
 Location: Hudson County Prosecutor's Office, Forensic Laboratory, Jersey City, NJ.  
 Salary: Commensurate with Experience.  
 Application Deadline: Open until Filled.

**Duties and Responsibilities:** The successful candidate will independently carry out examinations of suspected controlled dangerous substances submitted by various law enforcement agencies in connection with criminal investigations and prosecutions using chemical and instrumental analyses. Responsibilities include: Utilize GC/MS and FTIR instruments; interpret chromatographic data; carry out wet chemical analyses; perform peer review of case files; maintain essential laboratory equipment, instruments, records and files; prepare certified laboratory reports; testify in federal, state and municipal courts; and perform other related duties as assigned. The applicant must have the ability to communicate well and work closely with laboratory, legal and administrative personnel; have a working knowledge of computer software, databases and word processing; and have knowledge of Quality Control/Assurance principles.

**Qualifications:** A minimum of a B.S. degree in forensic science or chemistry or a physical science with at least twenty-four (24) semester hours in chemistry. The ideal candidate will have a minimum of one-year experience analyzing controlled substances.

Contact: DLT. Roger Forsthoff, Director  
 HCPO Forensic Laboratory  
[rforsthoff -at- hcpo.org](mailto:rforsthoff-at-hcpo.org) (201/915-1309)

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## Microgram Surface Mail Address Change

On October 12th, 2007 the address for “hard” mailings to the *Microgram* Editor was changed to:

DEA Headquarters  
Attn: Office of Forensic Sciences/Microgram Editor  
8701 Morrisette Drive  
Springfield, VA 22152

\* \* \* \* \*

## Microgram email Address Changes

Effective January 1st, 2008 the email address for the *Microgram* Editor will be:

[DEA-Microgram-2008 -at- mailsnare.net](mailto:DEA-Microgram-2008-at-mailsnare.net)

The current email address ( [microgram-2007 -at- mailsnare.net](mailto:microgram-2007-at-mailsnare.net) ) will be monitored until January 31st, 2008. An automated response will direct senders to the new address until April 1st, 2008, at which point the account will lapse.

Important Notes to All Subscribers: All subscribers with filters on their accounts should immediately “whitelist” the [DEA-Microgram-2008 -at- mailsnare.net](mailto:DEA-Microgram-2008-at-mailsnare.net) email address. In addition, it is recommended that the current and previous email addresses used for *Microgram* ( [microgram-2007 -at- mailsnare.net](mailto:microgram-2007-at-mailsnare.net) (and) [microgram\\_editor -at- mailsnare.net](mailto:microgram_editor-at-mailsnare.net) ) be automatically filtered (blocked) after January 1st, 2008. They will no longer be used by *Microgram* after this date; therefore, any subsequent emails from these addresses will be spam - note that the *Microgram* email addresses are already routinely “hijacked” and used to send spam, and this fraudulent use will continue and likely will increase in future years (it is not possible for the *Microgram* Editor to prevent or control this problem).

All subscribers should notify their IT security personnel of all the above changes.

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# Microgram

## *Bulletin*

**Published by:**

The Drug Enforcement Administration  
Office of Forensic Sciences  
Washington, DC 20537

The U.S. Attorney General has determined that the publication of this periodical is necessary in the transaction of the public business required by the Department of Justice. Information, instructions, and disclaimers are published in the January issues.

- JANUARY 2008 -

**- INTELLIGENCE ALERT -**

**ECSTASY COMBINATION TABLET (CONTAINING METHAMPHETAMINE,  
BZP, TFMPP, MDMA, DIBENZYLPIPERAZINE, AND PROCAINE)  
IN CONCORD, CALIFORNIA**

The Contra Costa County Sheriff - Coroner's Office Forensic Services Division Laboratory (Martinez, California) recently received a single blue tablet with an Iron Cross logo, approximately 9 millimeters in diameter, suspected Ecstasy (see Photo 1). The exhibit was seized from an individual in Concord by the Concord Police, pursuant to a local arrest for possession (no further details). Analysis of a basic petroleum ether extract by GC/MS indicated a complex mixture of methamphetamine, benzylpiperazine (BZP), trifluoro-methylphenylpiperazine (TFMPP), MDMA, 1,4-dibenzylpiperazine, and procaine (BZP not quantitated, but a moderate loading based on the TIC). This was the laboratory's first encounter with a tablet with this logo, and also with BZP in any form.



**Photo 1**

[Editor's Note: This also appears to be the first report of dibenzylpiperazine to *Microgram*.]

**- INTELLIGENCE ALERT -**

**LARGE SEIZURE OF PSILOCYBIN MUSHROOMS AND MARIJUANA  
IN MONTGOMERY COUNTY, MISSOURI**

The Missouri State Highway Patrol Crime Laboratory (Jefferson City) recently received five medium sized suitcases, one containing three 5-gallon bags of dried mushrooms, one containing two 5-gallon bags of dried mushrooms, all presumed psilocybe mushrooms (see Photo 2), and three containing vacuum sealed plastic bags containing dried plant material, all presumed marijuana (no photos). The exhibits were seized in Montgomery County (about 80 miles west of St. Louis) by the Missouri State Highway Patrol - Troop F (no further details). Analysis of the mushrooms (total net mass 2.25 kilograms) by TLC and GC/MS confirmed psilocin (not quantitated). Analysis of the plant material (total net mass 5.40 kilograms) by microscopic examination, TLC, and modified Duquenois-Levine confirmed marijuana (THC not quantitated). The laboratory has previously seen similar exhibits, but this is believed to be the largest ever submission of psilocybe mushrooms to the laboratory.



**Photo 2**

\* \* \* \* \*

**- INTELLIGENCE ALERT -**

**WOOD CHIPS IMPREGNATED WITH COCAINE IN BOLIVIA**

The DEA Special Testing and Research Laboratory (Dulles, Virginia) recently received a submission of thin, brown wood chips from the DEA Cochabamba, Bolivia Resident Office, suspected to contain cocaine (see Photo 3). The exhibit (total net mass 16 grams) was a sample from a larger seizure made by the Bolivian National Police (location and details not provided). Analysis of a chloroform extract of the chips with GC, GC/MS, and FTIR/ATR confirmed 5.0 percent cocaine (relative to sample weight), calculated as the hydrochloride. This is the first submission of this type to the Special Testing and Research Laboratory.



**Photo 3**

\* \* \* \* \*



**- INTELLIGENCE ALERT -**

**HEROIN SMUGGLED FROM BOGOTA TO MIAMI  
IN AN OPERATIONAL LAPTOP COMPUTER**

The DEA Northeast Laboratory (New York, New York) recently received a laptop computer and its external power supply, both containing concealed packages of beige powder, suspected heroin (see Photos 4 and 5, both displayed oversize to show detail). The exhibits were seized by Immigration and Customs Enforcement personnel from a passenger arriving at Miami's International Airport from a flight originating from Bogota, Colombia. Unusually, the computer was apparently functional, with LED lights and fans operational when turned on. The laptop had four packages, each wrapped in tape and carbon paper, placed in the areas normally occupied by the second internal battery and the CD drive (both of which had been removed). The power supply contained a single, similarly wrapped package. Analysis of the powder (total net mass 520.9 grams) by GC/FID, GC/MS, and FTIR/ATR confirmed 67 percent heroin hydrochloride, adulterated with caffeine and thiamine (adulterants not quantitated). This was the first time the Northeast Laboratory has received a laptop that was apparently functional; however, a second such laptop has since been submitted to the laboratory.

[Editor's Notes: There have been a number of reports to *Microgram* of non-functional computers and/or computer components being used to smuggle controlled substances. This is the first report of a partially operational computer used in this manner, and appears to be intended to take advantage of the common practice of passing electronics through airport security checkpoints once they have been shown to be "operational."]



**Photo 4**



**Photo 5**



**- INTELLIGENCE ALERT -**

**FRESH PEYOTE IN GOOCHLAND, VIRGINIA**

The DEA Mid-Atlantic Laboratory (Largo, Maryland) recently received a box of tubers, suspected fresh peyote cacti (see Photo 6). The exhibit was seized in Goochland, Virginia by agents from the DEA Richmond District Office (Goochland is about 20 miles west-northwest of Richmond). Analysis of the material (total net mass 471.8 grams) by GC/FID and GC/MS confirmed mescaline (3,4,5-trimethoxyphenethylamine; not quantitated). This is the first submission of fresh peyote cacti to the Mid-Atlantic Laboratory.



**Photo 6**

\* \* \* \* \*

**- INTELLIGENCE ALERT -**

**ECSTASY MIMIC TABLETS (CONTAINING BZP, TFMPP, AND CAFFEINE)  
IN DETROIT, MICHIGAN**

The DEA North Central Laboratory (Chicago, Illinois) recently received nine exhibits containing a total of 1432 tablets of varying colors and logos, all suspected MDMA (no photos). The exhibits were acquired via two purchases in Detroit by DEA and Task Force personnel (details sensitive). The tablets were all approximately 8 mm in diameter by 5 mm thick, and averaged 288 milligrams (ranging from 269 to 303 milligrams). The colors and logos included yellow tablets with Air Jordan logos, purple/blue tablets with Adidas logos, pink tablets with teddy bear logos, and pink tablets with a man's head silhouette logo. Analysis of the tablets via GC/MS and GC/FID, however, indicated not MDMA but rather a mixture of benzylpiperazine (BZP),

trifluoromethylphenylpiperazine (TFMPP), and caffeine. The BZP was not formally quantitated, but was estimated to be 84 milligrams per tablet based on the GC/FID chromatogram (average of three different tablets). These were the first submissions of Ecstasy mimic tablets containing BZP to the North Central Laboratory in several years; however, since these submissions, the laboratory has seen an increase in tablets containing BZP, both with and without MDMA.

\* \* \* \* \*

### **- INTELLIGENCE ALERT -**

## **LARGE SEIZURE OF MDMA POWDER IN OKANOGAN COUNTY, WASHINGTON**

The DEA Western Laboratory (San Francisco, California) recently received 30 uniformly packaged one-gallon plastic bags containing a fluffy tan powder, suspected MDMA (see Photo 7; note that the smudge marks on the packages are smeared magic marker markings on the inner plastic bags). The exhibits were seized by Immigrations and Customs Enforcement personnel from a stash-site near a fixed wing aircraft that had abruptly landed at a makeshift airstrip in Okanogan County (central Washington) after entering U.S. airspace from Canada.



**Photo 7**

Analysis of the powder (total net mass 29.89 kilograms) by color testing, IR, GC/FID, GC/MS, and HPLC confirmed 96 percent MDMA HCl. The Western Laboratory rarely receives MDMA powder exhibits of this size.

\* \* \* \* \*

## **SELECTED REFERENCES**

[The Selected References section is a compilation of recent publications of presumed interest to forensic chemists. Unless otherwise stated, all listed citations are published in English. Abbreviated mailing address information duplicates that provided by the abstracting service. Patents and Proceedings are reported only by their *Chemical Abstracts* citation number.]

1. Awad T, DeRuiter J, Clark CR. **Chromatographic and mass spectral studies on methoxy methyl methamphetamines related to 3,4-methylenedioxymethamphetamine.** Journal of Chromatographic Science 2007;45(8):466. [Editor's Notes: Mass spectral differentiation of 3,4-MDMA from some of the methoxy methyl methamphetamines was possible after formation of the pentafluoropropionamide (PFPA) and heptafluorobutyramide (HFBA) derivatives. Contact: Auburn Univ, Sch Pharm, Dept Pharmacol Sci, Auburn, AL 36849.]
2. Awad T, Clark CR, DeRuiter J. **GC-MS analysis of acylated derivatives of the side-chain regioisomers of 4-methoxy-3-methylphenethylamines related to methylenedioxy-**

- methamphetamine.** Journal of Chromatographic Science 2007;45(8):477. [Editor's Notes: The 5 side-chain regioisomers of the title parent compound were examined. Mass spectral differentiation was possible after formation of the perfluoroacyl derivatives, pentafluoropropionamides and heptafluorobutyrylamides. Contact: Auburn Univ, Sch Pharm, Dept Pharmacol Sci, Auburn, AL 36849.]
3. Awad T, DeRuiter J, Clark CR. **Gas chromatography-mass spectrometry analysis of regioisomeric ring substituted methoxy methyl phenylacetones.** Journal of Chromatographic Science 2007;45(8):458. [Editor's Notes: The 10 regioisomeric methoxy methyl phenylacetones were prepared from the appropriately substituted benzaldehydes. Complete resolution of all ten regioisomeric ketones was obtained on a stationary phase containing modified beta-cyclodextrin. The compounds demonstrate essentially equivalent mass spectra with major fragment ions at m/z 135 and 43. The methoxy methyl phenylacetones with an ortho methoxy group show a further fragmentation to lose formaldehyde (CH<sub>2</sub>O) and yield a significant ion at m/z 105. Contact: Auburn Univ, Sch Pharm, Dept Pharmacol Sci, Auburn, AL 36849.]
  4. Boleda MR, Galceran MT, Ventura F. **Trace determination of cannabinoids and opiates in wastewater and surface waters by ultra-performance liquid chromatography-tandem mass spectrometry.** Journal of Chromatography A 2007;1175(1):38. [Editor's Notes: UPLC-MS/MS was used to detect and quantify cannabinoids (THC), opiates (morphine, codeine, heroin, methadone, fentanyl) and their metabolites. Contact: AGBAR, Aigües de Barcelona,AVINGUDA Diagonal 211, 08018 Barcelona, Spain.]
  5. Du H, Ge H, Yu L, Wang X. **Fast detection of clonazepam mixed illegally in traditional Chinese medicine by TLCS.** Zhongguo Yaoshi 2007;10(9):891. [Editor's Notes: TLCS was used to detect clonazepam in a Danlian Anshen capsule. This article is written in Chinese. Contact: Institute for Drug Control, Chinese People's Armed Police Forces, Beijing 102613, Peop. Rep. China.]
  6. Giraudon I, Bello PY. **Monitoring ecstasy content in France: Results from the national surveillance system 1999-2004.** Substance Use & Misuse 2007;42(10):1567-78. [Editor's Notes: A survey and discussion. 7,004 tablets were analyzed. Contact: Observatoire Français des Drogues et Toxicomanies (French Monitoring Centre for Drugs and Drug Addiction); no further addressing information was provided.]
  7. Lin X, Wang J, Li L, Wang X, Lü H, Xie Z. **Separation and determination of five major opium alkaloids with mixed mode of hydrophilic/cation-exchange monolith by pressurized capillary electrochromatography.** Journal of Separation Science 2007;30(17):3011. [Editor's Notes: Presents analysis of Pericarpium papaveris by pCEC on a monolithic column; the title alkaloids were narcotine, papaverine, thebaine, codeine, and morphine. Contact: Department of Chemistry, Fuzhou University, Fuzhou, Fujian, P. R. China.]
  8. Luiz da Costa J, Wang AY, Micke GA, Maldaner AO, Romano RL, Martins-Junior HA, Negrini Neto O, Tavares MFM. **Chemical identification of 2,5-dimethoxy-4-bromoamphetamine (DOB).** Forensic Science International 2007;173(2-3):130. [Editor's Notes: Presents the title study on a 31 capsule seizure (each containing only 1.5 milligrams of powder). Analyses were performed using color tests, HPTLC, CZE, MS, CID-MS, and IR. Contact: Instrumental Analysis Laboratory, Criminalistic Institute of Sao Paulo, Sao Paulo-SP, Brazil.]
  9. Pavlova V, Petrovska-Jovanovic S. **Simultaneous determination of amphetamine, methamphetamine, and caffeine in seized tablets by high-performance liquid**

**chromatography.** Acta Chromatographica 2007;18:157. [Editor's Notes: The HPLC method used was reverse phase; UV was used for detection and identification. Contact: Institute of Chemistry, Faculty of Natural Science and Mathematics, Saints Cyril and Methodius University, Skopje, Macedonia 1000.]

10. Reid RG, Durham DG, Boyle SP, Low AS, Wangboonskul J. **Differentiation of opium and poppy straw using capillary electrophoresis and pattern recognition techniques.** Analytica Chimica Acta 2007;605(1):20. [Editor's Notes: Opium samples from four different locations, and poppy straw from different plant varieties, were assayed using micellar CE incorporating a sweeping technique. Alkaloids (morphine, codeine, papaverine, noscapine, thebaine, oripavine, reticuline and narceine) were quantitatively determined. Pattern recognition of the samples by hierarchical cluster analysis and principal component analysis showed distinct clusters. Contact: School of Pharmacy, The Robert Gordon University, Schoolhill, Aberdeen AB10 1FR, UK.]
11. Webb R, Doble P, Dawson M. **A rapid CZE method for the analysis of benzodiazepines in spiked beverages.** Electrophoresis 2007;28(19):3553. [Editor's Notes: The title substrates were nitrazepam oxazepam, alprazolam, flunitrazepam, temazepam, diazepam, 7-aminoflunitrazepam, 7-aminonitrazepam and 7-aminoclonazepam. The validated method was successfully applied to beverages that had been spiked with benzodiazepines at concentrations simulating prescription tablets. With one exception, no sample pretreatment was required. Contact: Centre for Forensic Science, Department of Chemistry, Materials and Forensic Science, University of Technology, Sydney, NSW, Australia.]

\* \* \* \* \*

## THE JOURNAL/TEXTBOOK COLLECTION EXCHANGE

The Journal/Textbook Collection Exchange is a service intended to facilitate the transfer of unwanted journals and textbooks to forensic libraries or other *Microgram* subscribers. At present, this service is offered once a quarter (in January, April, July, and October). The current donations are listed below. The offers are First Come/First Serve (except **libraries have preference**). There are no charges to the requestor. Please provide a full mailing address in the request. **Important!:** Do not provide an address that irradiates mail!

### *Journal of Forensic Sciences:*

1992 - All  
1993 - January (#1, 2 Copies), March (#2), July (#4), September (#5), and November (#6)  
1994 - March (#2), May (#3), and July (#4)  
2005 - May (#3) and July (#4)

**All subscribers are encouraged to donate surplus or unwanted items/collections.** Reference texts and long runs of forensic/analytical journals are of particular interest; however, even single issues are worthwhile, and may fill a hole in an existing collection. If interested, please consult the *Microgram* website or contact the *Microgram* Editor for further instructions.

The next offering of journals and textbooks will be in the April 2008 issue of *Microgram Bulletin*.

\* \* \* \* \*

## THE DEA FY 2008 STATE AND LOCAL FORENSIC CHEMISTS SEMINAR SCHEDULE

The remaining FY 2008 schedule for the State and Local Forensic Chemists Seminar is as follows:

March 10 - 14      May 5 - 9      September 8 - 12

The school is open only to forensic chemists working for law enforcement agencies, and is intended for chemists who have completed their agency's internal training program and have also been working on the bench for at least one year. There is no tuition charge. The course is held at the Hyatt Place Dulles North in Sterling, Virginia (near the Washington/Dulles International Airport). A copy of the application form is reproduced on the last page of the August 2004 issue of *Microgram Bulletin*. (See: <http://www.dea.gov/programs/forensicsci/microgram/mg0804/aug04.pdf>) Completed applications should be mailed to the Special Testing and Research Laboratory (Attention: J. Head) at: 22624 Dulles Summit Court, Dulles, VA 20166. For additional information, call 703/668-3349.

\* \* \* \* \*

### Microgram Surface Mail Address Change

On October 12th, 2007 the address for "hard" mailings to the *Microgram* Editor changed to:

DEA Headquarters  
Attn: Office of Forensic Sciences/Microgram Editor  
8701 Morrisette Drive  
Springfield, VA 22152

\* \* \* \* \*

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Important Notes to All Subscribers: All subscribers with filters on their accounts should immediately "whitelist" the [DEA-Microgram-2008 -at- mailsnare.net](mailto:DEA-Microgram-2008-at-mailsnare.net) email address. In addition, it is recommended that the current and previous email addresses used for *Microgram* ( [microgram-2007 -at- mailsnare.net](mailto:microgram-2007-at-mailsnare.net) (and) [microgram\\_editor -at- mailsnare.net](mailto:microgram_editor-at-mailsnare.net) ) be automatically filtered (blocked) after January 1st, 2008. They will no longer be used by *Microgram* after this date; therefore, any subsequent emails from these addresses will be spam - note that the *Microgram* email addresses are already routinely "hijacked" and used to send spam, and this fraudulent use will continue and likely will increase in future years (it is not possible for the *Microgram* Editor to prevent or control this problem).

All subscribers should notify their IT security personnel of all the above changes.



## Information and Instructions for *Microgram Bulletin*

[Editor's Preface: The following information and instructions are derived from the *Microgram* website < <http://www.dea.gov/programs/forensicsci/microgram/index.html> >, and are provided here for the convenience of those subscribers who are only receiving printed "circulation" copies of *Microgram Bulletin* at their Offices.]

### **General Information**

*Microgram Bulletin* is a monthly newsletter published by the U.S. Drug Enforcement Administration's Office of Forensic Sciences, and is primarily intended to assist and serve forensic scientists concerned with the detection and analyses of suspected controlled substances for forensic/law enforcement purposes.

### **Access to *Microgram Bulletin***

*Microgram Bulletin* is unclassified (as of the January 2003 issue), and is published on the DEA public access website (see the above URL). At this time, *Microgram Bulletin* is available only electronically, and requires Internet access. Professional scientific and law enforcement personnel may request email notifications when new issues are posted (such notifications are not available to private citizens). The publications themselves are never sent electronically (that is, as attachments).

Requests to be added to the email notification list should preferably be submitted via email to the *Microgram* Editor at: [DEA-Microgram-2008-at-mailsnare.net](mailto:DEA-Microgram-2008-at-mailsnare.net) Requests can also be mailed to: DEA Headquarters; Attn: Office of Forensic Sciences/Microgram Editor; 8701 Morrisette Drive; Springfield, VA 22152. All requests to be added to the *Microgram* email notification list should include the following **Standard Contact Information**:

- \* The Full Name and Mailing Address of Submitting Laboratory or Office;
- \* The Full Name, Title (Laboratory Director, Assistant Special Agent in Charge, Librarian, etc.), Phone Number, FAX Number, and Preferred email Address of the Submitting Individual (Note that (when possible) email notifications are mailed to titles, not names, in order to avoid problems arising from future personnel changes);
- \* If available, the generic email address for the Submitting Laboratory or Office;
- \* If a generic email address is not available, **one** stable email address for a long-term employee, who will be responsible for forwarding *Microgram* information to all of the other employees in the requestor's Office (**Note that only one email address per Office will be honored**).

Requests to be removed from the *Microgram* email notification list, or to change an existing email address, should also be sent to the *Microgram* Editor. Such requests should include all of the pertinent Standard Contact Information detailed above, and also should provide both the previous and the new email addresses.

Email notification requests/changes are usually implemented within six weeks.



### **Email Notifications** (Additional Comments)

As noted above, the email notification indicates which issue has been posted, provides the *Microgram* URL, and additional information as appropriate. Note that *Microgram* e-notices will NEVER include any attachments, or any hyperlink other than the *Microgram* URL. **This is important, because the Microgram email address is routinely hijacked and used to send spam, very commonly including malicious attachments.** For this reason, all subscribers are urged to have current anti-viral, anti-spyware, and firewall programs in operation. However, in order to ensure that the email notifications are not filtered as spam, the [DEA-Microgram-2008 -at- mailsnare](#) email address must be “whitelisted” by the Office’s ISP.

### **Costs**

Access to *Microgram Bulletin* is free.

### **Submissions to Microgram Bulletin**

*Microgram Bulletin* includes Intelligence Alerts, Intelligence Briefs, Safety Alerts, Selected Intelligence Briefs, Selected Literature References, Meeting Announcements, Employment Opportunities, pertinent sections from the Code of Federal Regulations, Columns of topical importance, and similar material of interest to the counter-drug community. Explanatory details for most of the above types of submission are detailed below, and typical examples are published in most issues of *Microgram Bulletin*.

All submissions must be in English. Because *Microgram Bulletin* is unclassified, **case sensitive information should not be submitted!** All submissions should, whenever possible, be submitted electronically, as straight email or as an IBM® PC-compatible Corel WordPerfect® or Microsoft Word® attachment, to: [DEA-Microgram-2008 -at- mailsnare.net](#) Current versions of Corel WordPerfect® or Microsoft Word® (defined as having release dates less than 5 years old) should be utilized. If email submission is not possible, submissions may be mailed to: DEA Headquarters; Attn: Office of Forensic Sciences/Microgram Editor; 8701 Morrisette Drive; Springfield, VA 22152. Hard copy mailings should be accompanied by an electronic version on either a 3 ½ inch IBM® PC-compatible diskette or a standard CD-R. **Note that diskettes should be mailed in an irradiation-proof protective sleeve, and the mailing envelope should be marked: “Warning - Contains Electronic Media - Do Not Irradiate”.** Note also that mailed submissions may be subject to lengthy handling delays beyond the control of the Office of Forensic Sciences, and electronic media sent through the mail may be destroyed en route by sanitizing procedures, despite protective measures and written warnings. All submissions should include the following **Contact Information:** The Full Name and Address of Submitting Laboratory or Office, and the Full Name, Phone Number, FAX Number, and Preferred email Address of the Submitting Individual.

**Intelligence Alerts and Briefs** are concise synopses of the physical and chemical characteristics of novel and/or interesting exhibits submitted to law enforcement laboratories involved in the detection and analyses of suspected controlled substances for forensic/law enforcement purposes. Alerts have some unusual aspect, such as a novel drug, an atypical formulation, or a new smuggling technique, whereas Briefs are reports of routine analyses (that is, that confirmed what was suspected/expected). Both Alerts and Briefs should include descriptive details adhering to (as appropriate) the following outline:

What laboratory did the analysis? (Full Name)

Where is the laboratory located?

What agency seized the exhibit?

Where was the exhibit seized? (If an obscure locale, give distance and direction from the nearest city)

Were there any interesting (but non-sensitive) aspects of the seizure (traffic stop, unusual smuggling technique, at a “Rave,” etc.)

What controlled substance was suspected upon submission?  
Detailed physical description (appearance, dimensions, logos, odor, packaging, etc.)  
Quantities (numbers of tablets, packages or bricks, average mass, total net mass, etc.)  
Photos (see additional information, below)  
What techniques were used to analyze the exhibit?  
Actual composition of the exhibit?  
Quantitation data? (if not quantitated, provide a qualitative approximation if possible)  
Adulterants and diluents? (if identified, especially if unusual)  
First seizure of this type? (if not, provide brief details of previous examples)  
Editorial comments? (if any)  
Literature references for unusual submissions? (if needed)

In order to avoid confusion, if uncommon controlled substances are identified, the description should use the full chemical name(s) of the identified substances (if desired, acronyms or street terminology (e.g., "Foxy-Methoxy", "Nexus", or "STP") can be included in parentheses after the full chemical name).

**Photographs should be provided as ATTACHMENTS, not as embedded images in documents.** Jpeg images are preferred. Photographs should be of reasonable size - 150 - 250 kbytes per photograph. Unless the scale is obvious, photographs of subject exhibit(s) should include either a metric ruled scale or a coin or bill (U.S. currency) to place the exhibit's size in context.

**Safety Alerts** are urgent communiques to the *Microgram Bulletin* readership which give notice of a specific safety issue of particular interest to forensic or crime laboratory personnel, or to law enforcement personnel dealing with controlled substances. They should include a concise synopsis of the incident(s), recommendations (if any), pertinent literature citations (if any are known), and a mechanism for providing feedback (if appropriate).

**Selected Intelligence Briefs** are reprinted (with permission) unclassified intelligence briefs of presumed interest to the *Microgram Bulletin* readership that have been previously published in restricted or non-restricted publications or websites that are also dedicated to the detection and analyses of suspected controlled substances for forensic/law enforcement purposes. Selected Intelligence Briefs must be unclassified, and should be a minimum of 1 page and a maximum of 10 pages in length (single spaced at 11 pitch Times New Roman font, including photos, tables, charts, etc.) All *Microgram Bulletin* subscribers are invited to submit such material, which must include the author's and publisher's contact information.

**Selected Literature References** is a monthly compilation of reference citations of presumed interest to the *Microgram Bulletin* readership, derived from approximately 7,500 scientific periodicals. The focus of the Selected Literature References is the detection and analysis of suspected controlled substances for forensic/law enforcement purposes. References from clinical and toxicological journals are included only if the material is considered to be of high interest to forensic chemists (for example, contains the mass spectra of an unusual substance that is not known to be published elsewhere). Note that citations from obscure periodicals may be missed, and all *Microgram Bulletin* subscribers are invited to submit citations of interest if they do not appear in *Microgram Bulletin* within three months of their publication. Of particular interest are articles from regional forensic science associations that are unlikely to be noted by any abstracting service. Citations should include a summary sentence and the primary author's contact information.

**Meeting Announcements** list upcoming meetings of presumed interest to the *Microgram Bulletin* readership. **In general, only meetings which are dedicated to forensic chemistry/forensic drug analysis or include a subsection so dedicated will be publicized in *Microgram Bulletin*.** Meeting Announcements should include the Formal Title, Sponsoring Organization, Inclusive Dates, Location

(City, State, and specific locale), Registration Deadline, Recommended Hotel (include details on special rates and deadlines where applicable), and Contact Individual's Name, Phone Number, and email Address. If available, the URL for the meeting website should also be included in the Announcement. Meeting Announcements will be posted for a maximum of three consecutive months, or (alternately) three times every other month over a five month period, but not past the registration deadline.

**Employment Opportunities** lists job announcements of presumed interest to the *Microgram Bulletin* readership. **In general, only jobs with a forensic chemistry/forensic drug analysis focus for Federal, State, or Local Crime Laboratories or Offices will be publicized in *Microgram Bulletin*.** Exceptions may be requested and will be considered on a case-by-case basis (for example, an academic position in a Forensic Chemistry Department). Employment Opportunity announcements should include the Formal Title of the Organization, Formal Title of the Laboratory or Office, Position Title, Laboratory or Office Location (City and State), Salary Range, Opening and Closing Dates, Duties, General Requirements, Specialized Requirements (if any), Application Procedures, and the Contact Individual's Name, Phone Number, email Address, and Mailing Address. If available, the URL for the agency's website, and (if available) the specific URL for the job posting should also be included in the Announcement. Employment Opportunities will be posted for a maximum of 3 consecutive months, but not past the application deadline.

#### **The Journal/Textbook Collection Exchange**

If any subscriber is interested in donating any forensic or analytical chemistry journal and/or textbook collection to a fellow subscriber or library, *Microgram Bulletin* is willing to list the offered materials and the associated contact information in a future issue (currently January, April, July, and October). The general format should follow the example in the January 2003 issue, and should be sent via email to the *Microgram* Editor at: [DEA-Microgram-2008 -at- mailsnare.net](mailto:DEA-Microgram-2008-at-mailsnare.net) Only items for donation (not for sale) will be considered for publication, and donations to libraries should adhere to journal restrictions and/or time limits (if any) on such offers.

#### **Requests for *Microgram* and/or *Microgram Bulletin* Archives, 1967 - 2002**

All issues of *Microgram* (November 1967 - March 2002) and the first nine issues of its successor *Microgram Bulletin* (April - December 2002) were and continue to be **Law Enforcement Restricted** publications, and are therefore (permanently) unavailable to the general public. [Note that this restriction includes requests made under the Freedom of Information (FOI) Act.]

However, the entire collection, individual issues, or individual sections of issues (e.g., specific articles) are available to law enforcement affiliated offices and laboratories. Requests from such offices and laboratories **must be made on official letterhead** and mailed to:

DEA Headquarters  
Attn: Office of Forensic Sciences/*Microgram* Editor  
8701 Morrisette Drive  
Springfield, VA 22152.

Requests will be sent either by CD or in hard copy (photocopy), as appropriate.

Note that requests made via email will not be honored.

## DISCLAIMERS

1) All material published in *Microgram Bulletin* is reviewed prior to publication. However, **the reliability and accuracy of all published information are the responsibility of the respective contributors, and publication in *Microgram Bulletin* implies no endorsement by the United States Department of Justice or the Drug Enforcement Administration.**

2) Due to the ease of scanning, copying, electronic manipulating, and/or reprinting, **only the posted copies of *Microgram Bulletin* (on [www.dea.gov](http://www.dea.gov)) are absolutely valid.** All other copies, whether electronic or hard, are necessarily suspect unless verified against the posted versions.

3) **WARNING!:** Due to the often lengthy time delays between the actual dates of seizures and their subsequent reporting in *Microgram Bulletin*, and also because of the often wide variety of seizure types with superficially similar physical attributes, published material cannot be utilized to visually identify controlled substances currently circulating in clandestine markets. **The United States Department of Justice and the Drug Enforcement Administration assume no liability for the use or misuse of the information published in *Microgram Bulletin*.**

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# Microgram

## *Bulletin*

**Published by:**

The Drug Enforcement Administration  
Office of Forensic Sciences  
Washington, DC 20537

The U.S. Attorney General has determined that the publication of this periodical is necessary in the transaction of the public business required by the Department of Justice. Information, instructions, and disclaimers are published in the January issues.

- FEBRUARY 2008 -

**- SAFETY ALERT / INTELLIGENCE ALERT -**

**LIVE AMMUNITION IN PACKAGES OF COMPRESSED MARIJUANA  
IN ANDRADE, CALIFORNIA**

The DEA Southwest Laboratory (Vista, California) recently received a multi-part exhibit of plant material, consisting of one intact, tape-wrapped plastic package and 10 core samples, all suspected marijuana (total net mass approximately 300 grams). The package and core samples were selected from 21 such packages seized from within a truck tire by Immigration and Customs Enforcement (ICE) personnel in Andrade, California (about 150 miles east of San Diego). Upon opening the intact package, a live 7.62 millimeter rifle round was discovered within the plant material (see Photo 1). The package was subsequently X-rayed, and three other live rounds were

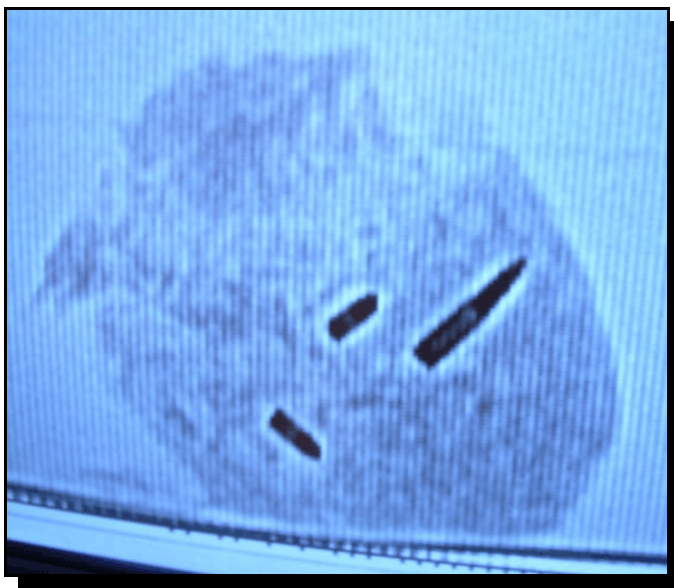


**Photo 1 - Note that the package is about 10 inches in diameter.**



discovered, including another 7.62 round and two 7.65 millimeter handgun rounds (see Photo 2). Analysis of the plant material by microscopy, Duquenois-Levine, and TLC confirmed marijuana (THC not quantitated). X-ray screening of the other 20 packages (by ICE personnel) revealed an additional 12 rounds in those exhibits (distribution and types not provided). This is the first instance of ammunition discovered within marijuana at the Southwest Laboratory.

[Editor's Note: This also appears to be the first-ever report to *Microgram* of any form of ammunition in a package of any type of controlled substance.]



**Photo 2**

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### **- INTELLIGENCE ALERT -**

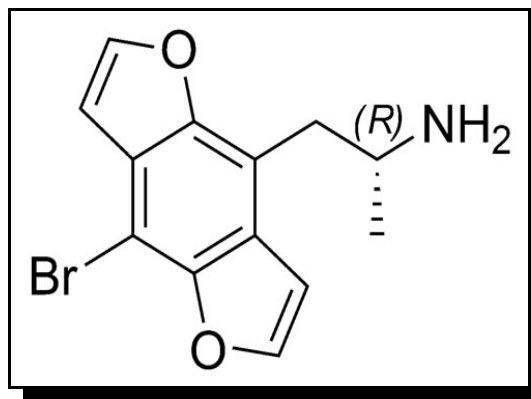
#### **“BROMO-DRAGONFLY” IN QUEENSLAND, AUSTRALIA**

The Queensland Health Forensic and Scientific Services Clandestine Laboratory Division (Brisbane, Australia) recently received a submission of five exhibits, one labelled as and all suspected to contain Bromo-DragonFLY

(1-(8-bromobenzo[1,2-*b*;4,5-*b'*]-difuran-4-yl)-2-aminopropane hydrochloride;

Bromo-Benzodifuranyl-Isopropylamine Hydrochloride), a hallucinogenic designer drug related to 4-Bromo-2,5-dimethoxyamphetamine (DOB) and 4-bromo-2,5-dimethoxyphenethylamine (2C-B) (see Figure, right). The exhibits consisted of:

A) A clip sealed plastic bag containing a quantity of a pink powder, hand-labelled as “FLY 4 Bromo Dragonfly” (see Photo 3 (all photos next page)); B) a plastic jar containing a pink paste (see Photo 4); and C) three different bottles each containing a pink liquid with a suspended pink sediment (see Photos 5, 6, and 7). The jar and all three bottles were commercially labelled as various forms of specialty paints. The exhibits were seized by the Australian Crime Commission (circumstances sensitive). Analysis of the materials (total net mass approximately 750 grams) by GC/MS, GC/IRD, and FTIR confirmed Bromo-DragonFLY (NMR and XRD analyses are still pending). This was the laboratory's first encounter with Bromo-DragonFLY, and appears to be the first such seizure within Australia. This was also the laboratory's first encounter with smuggling illicit substances as paints.



**Bromo-DragonFLY**



[Editor's Notes: This is the second report of Bromo-DragonFLY to *Microgram*; see: Anonymous. "Bromo DragonFLY" (Bromo-Benzodifuranyl-Isopropylamine) in Ashland, Oregon. *Microgram Bulletin* 2007;40(8):78. For analytical data, see: Reed EC, Kiddon GS. The characterization of three FLY compounds. *Microgram Journal* 2007;5(1-4):27-33.]



Photo 3



Photo 4



Photo 5



Photo 6



Photo 7

**- INTELLIGENCE ALERT -**

**ECSTASY COMBINATION TABLETS (CONTAINING MDMA,  
METHAMPHETAMINE, BENZYLPIPERAZINE, AND  
TRIFLUOROMETHYLPHENYLPIPERAZINE) IN MILWAUKEE, WISCONSIN**

The Wisconsin State Crime Laboratory - Milwaukee recently received 100 blue, round tablets with a raised diamond logo, suspected Ecstasy (see Photo 8). The exhibit was acquired by the Division of Criminal Investigation Narcotics Bureau in an undercover buy operation in Milwaukee. Analysis of the tablets (total net mass 28.9 grams) using color tests (Marquis (+), Mecke (+), PDMAB (strong yellow), and Scott's (-)), GC, and GC/MS confirmed MDMA, methamphetamine, N-benzylpiperazine (BZP), N-(3-trifluoromethylphenyl)-piperazine (TFMPP), caffeine, and procaine (ratio based on the TIC: 67 : 11 : 24 : 10 : 33 : 100). This was the first submission of this logo and this drug combination in Ecstasy tablets to the laboratory.



**Photo 8**

[Editor's Notes: The color, dimensions, and drug combination in these tablets appear to be similar to a tablet reported in the January 2008 issue of *Microgram Bulletin* (page 1); however, that tablet (seized in Concord, California) had an iron cross logo.]

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**- INTELLIGENCE ALERT -**

**TERRY-CLOTH BATHROBE LACED WITH HEROIN BASE IN NEW YORK CITY**

The DEA Northeast Laboratory (New York, New York) recently received a tan colored, terry-cloth bathrobe, which was suspected of having been laced with heroin (see Photo 9). The exhibit was seized at a residence in New York City by Immigration and Customs Enforcement personnel. Analysis of representative sections and extracts of the bathrobe by color testing, microscopic crystal testing, FTIR/ATR, GC/MS, and GC/FID confirmed 7.5 percent heroin base and trace cocaine by weight in the cloth. Heroin-laced clothing is not unusual; however, heroin base is not commonly submitted (in any form) to the Northeast Laboratory.



**Photo 9**

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**- INTELLIGENCE ALERT -**

**HEROIN IN COMPUTER COOLING UNITS IN MIAMI, FLORIDA**

The DEA Southeast Laboratory (Miami, Florida) recently received 41 commercially packaged computer cooling units, two different types, each consisting of a plastic fan and a separate metal cooling grid; the metal grids each had a hidden compartment, containing a light brown powder, suspected heroin (see Photo 10). The exhibits were seized in Miami, Florida by Immigration and Customs Enforcement personnel (no further details). Analysis of the powder from one of the exhibits (total net mass 321.4 grams in 12 units) by FTIR, GC/MS, and GC/FID confirmed 86.9 percent heroin hydrochloride. This is the first such submission to the Southeast Laboratory.



**Photo 10**

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**- INTELLIGENCE BRIEF -**

**LARGE SEIZURE OF “ICE” METHAMPHETAMINE  
NEAR CORPUS CHRISTI, TEXAS**

The DEA South Central Laboratory (Dallas, Texas) recently received 75 plastic-wrapped, sealed plastic containers, each containing large crystalline shards, suspected “Ice” methamphetamine (see Photos 11 and 12). The containers were all the same size (about 6 x 12 x 3 inches), but were a variety of colors, both bodies and lids. The exhibits were seized by an unspecified law enforcement agency from the passenger side fuel tank of an 18-wheel truck in Sarita, Texas (about 100 miles north of Brownsville, Texas), and were submitted by the DEA Corpus Christi Resident Office. Analysis of the crystals (total net mass 74.7 kilograms) by FTIR, GC/MS, GC/FID, and HPLC confirmed 98.1 percent *d*-methamphetamine hydrochloride (“Ice”). This is the fifth largest seizure of methamphetamine ever submitted to the South Central Laboratory.



**Photo 11**



**Photo 12**



**- INTELLIGENCE ALERT -**

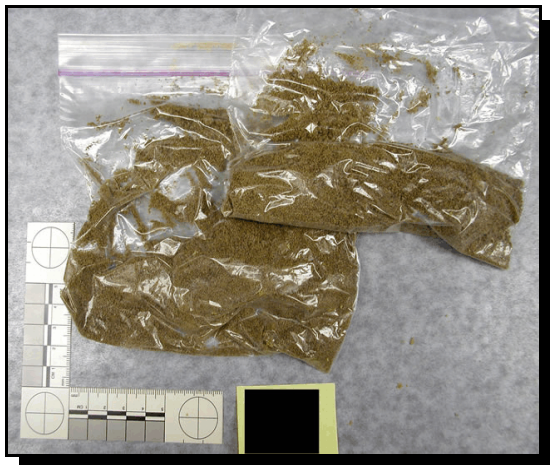
**MECHANICAL PREPARATION OF CONCENTRATED CANNABIS  
IN SALT LAKE CITY, UTAH**

The DEA Western Laboratory (San Francisco, California) recently received a 2-pound ziplock plastic bag commercially labeled as brown sugar, and containing a light brown, crystalline powder, presumed sucrose (see Photo 13). Hidden within the powder were two smaller ziplock bags, each containing a darker brown material, suspected marijuana (see Photo 14). The exhibit was seized by investigators at an express mailing facility in Salt Lake City, and was submitted by the DEA Salt Lake City Resident Office. The light brown, crystalline powder in the large bag was identified as sucrose.

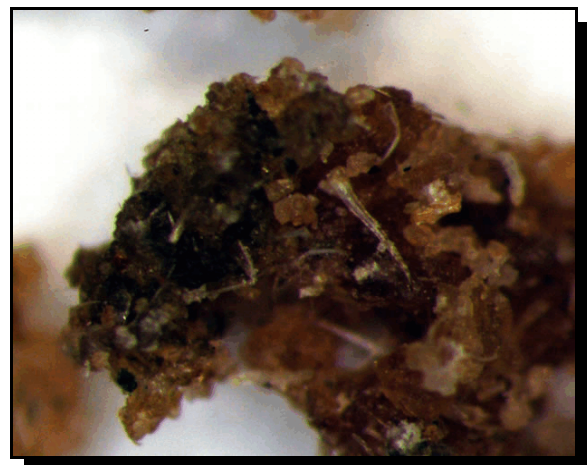
Analysis of the darker brown material in the smaller zip-lock bags (total net mass 55.2 grams) by GC/MS confirmed delta-9-tetrahydro-cannabinol (THC, not quantitated); however, no cannabinol, cannabidiol, or cannabichromene was identified. Stereomicroscopic examination showed fragmented trichomes, and it is suspected that the material had been sieved to remove resin and trichomes (see Photo 15). The Western Laboratory has previously received similar exhibits of this form of marijuana.



**Photo 13**



**Photo 14**



**Photo 15**

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## SELECTED REFERENCES

[The Selected References section is a compilation of recent publications of presumed interest to forensic chemists. Unless otherwise stated, all listed citations are published in English. Abbreviated mailing address information duplicates that provided by the abstracting service. Patents and Proceedings are reported only by their *Chemical Abstracts* citation number.]

1. Dal Cason TA. **Synthesis and identification of N,N-dimethylcathinone hydrochloride.** Microgram Journal 2007;5(1-4):3-12. [Editor's Notes: The syntheses and analyses of N,N-dimethylcathinone and N-ethylcathinone are presented and discussed. Contact: U.S. Department of Justice, Drug Enforcement Administration, North Central Laboratory, 536 S. Clark Street, Chicago, IL 60605.]
2. Fasanello JA, Placke AD. **The isolation, identification, and quantitation of dimethyltryptamine (DMT) in *Mimosa hostilis*.** Microgram Journal 2007;5(1-4):41-50. [Editor's Notes: Dimethyltryptamine (DMT) was extracted from the root bark of *Mimosa hostilis* via two methods, using methanol and acetic acid, respectively. FTIR/ATR, GC/MS, GC/IRD, <sup>1</sup>H-NMR, and HPLC data are presented. Quantitative analysis by <sup>1</sup>H-NMR and HPLC indicated 0.9 percent and 0.8 percent DMT, respectively, in the analyzed samples. Contact: U.S. Department of Justice, Drug Enforcement Administration, Northeast Laboratory, 99 Tenth Avenue, Suite 721, New York, NY 10011.]
3. Fucci N. **Analysis of fatty acids in marijuana (*Cannabis sativa* leaf).** Microgram Journal 2007;5(1-4):20-6. [Editor's Notes: Various fatty acids (palmitic, myristic, oleic, and stearic acids) were identified in 20 marijuana samples by GC/MS. This is believed to be the first study demonstrating the presence of fatty acids in marijuana. The potential value of the results in source determination and comparative analyses is discussed. Contact: Catholic University of the Sacred Heart, Institute of Legal Medicine, Largo Francesco Vito, 1- 00168 Rome, Italy.]
4. de Korompay A, Hill JC, Carter JF, Nic Daeid N, Sleeman R. **Supported liquid-liquid extraction of the active ingredient (3,4-methylenedioxymethylamphetamine) from ecstasy tablets for isotopic analysis.** Journal of Chromatography A 2008;1178(1):1. [Editor's Notes: Presents a simple method for the isolation of MDMA and other active ingredients from illicit ecstasy tablets, for subsequent IRMS analysis. No significant isotopic fractionation was observed as a result of the extraction process. Contact: Centre for Forensic Science, Department of Pure and Applied Chemistry, University of Strathclyde, Royal College, 204 George Street, Glasgow G1 1XW, UK.]
5. Panicker S, Wojno HL, Ziska LH. **Quantitation of the major alkaloids in opium from *Papaver setigerum* DC.** Microgram Journal 2007;5(1-4):13-9. [Editor's Notes: Quantitation of morphine and other major alkaloids in opium gum from specially cultivated *Papaver setigerum* DC ("Wild Poppy") by CE is presented. Morphine was confirmed at an average of 2 percent by weight. Codeine, noscapine, and papaverine were also detected; however, thebaine was below the limits of quantitation. Contact: U.S. Department of Justice, Drug Enforcement Administration, Special Testing and Research Laboratory, 22624 Dulles Summit Court, Dulles, VA 20166.]
6. Reed EC, Kiddon GS. **The characterization of three FLY compounds.** Microgram Journal 2007;5(1-4):26-33. [Editor's Notes: The analysis and characterization of 1-(8-bromo-2,3,6,7-tetrahydrobenzo[1,2-*b*;4,5-*b'*]-difuran-4-yl)-2-aminoethane hydrochloride (2C-B-FLY), 1-(8-bromo-2,3,6,7-tetrahydrobenzo[1,2-*b*;4,5-*b'*]-difuran-4-yl)-2-aminopropane

hydrochloride (3C-B-FLY), and 1-(8-bromobenzo[1,2-*b*;4,5-*b'*]difuran-4-yl)-2-aminopropane hydrochloride (Bromo-DragonFLY) are presented. GC/MS, IRD, and FTIR spectra are presented. Contact: Office of the Ohio Attorney General, 30 E. Broad Street, 14th Floor, Columbus, OH 43215.]

7. Ropero-Miller JD, Stout PR, Bynum ND, Casale JF. **Comparison of the novel direct analysis in real time time-of-flight mass spectrometry (AccuTOF-DART™) and signature analysis for the identification of constituents of refined illicit cocaine.** Microgram Journal 2007;5(1-4):34-40. [Editor's Notes: 25 Illicit cocaine samples were analyzed by AccuTOF-DART™. Potential applications, including use for signature analyses of controlled substances, are discussed. Contact: RTI International Center for Forensic Sciences, 3040 Cornwallis Road, Research Triangle Park, NC 27709.]
8. Waddell-Smith RJH. **A review of recent advances in impurity profiling of illicit MDMA samples.** Journal of Forensic Sciences 2007;52(6):1297. [Editor's Notes: A review of the title topic, from 2002 up to the end of 2006. Contact: School of Criminal Justice and Department of Chemistry, Michigan State University, 560 Baker Hall, East Lansing, MI 48824.]

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## EMPLOYMENT OPPORTUNITIES

Position: **Forensic Chemist.** (First Posting)  
Location: South Dakota Public Health Laboratory, Forensics Laboratory, South Dakota Department of Health, Pierre, SD.  
Salary: \$38,397 - \$47,997.  
Application Deadline: March 25, 2008.

Duties and Responsibilities: The successful candidate will perform urine and blood testing for drugs of abuse submitted by all levels of law enforcement in South Dakota. Responsibilities include utilizing GC/MS; interpret chromatographic data; perform wet chemical analyses; review files; maintain laboratory equipment, instruments and records, and testify to findings in federal, state and municipal court. The candidate will be the Department of Health's expert on urine and blood testing for drugs of abuse. The candidate will also act as backup to the blood alcohol and controlled substances laboratory. The applicant must have strong written and verbal communication skills, along with a strong knowledge of software, databases and word processing. A very strong knowledge of the principles of quality control/assurance is required.

Qualifications: A minimum of a Bachelors degree in forensic science, chemistry, or a physical science is required. An advanced degree is desirable. A minimum of two years experience examining blood, urine, or controlled substances is desired.

Contact: Further job information and application forms can be found at: <http://www.state.sd.us/bop/> For additional information, contact: S. Ellwanger or M. Smith at 605-773-3368: [stacy.ellwanger-at-state.sd.us](mailto:stacy.ellwanger-at-state.sd.us)

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# Microgram

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- MARCH 2008 -

**- INTELLIGENCE ALERT -**

**UNUSUAL “RICE KRISPIE TREAT”-LIKE BALLS CONTAINING PSILOCYBE MUSHROOM PARTS IN WARREN COUNTY, MISSOURI**

The Missouri State Highway Patrol Crime Laboratory - Jefferson City recently received two paper bags, one containing loose plant material and the second containing three brightly green colored “grain balls” (two inside a plastic zip-lock bag in the bag, and the third loose in the bag), all suspected marijuana (see Photo 1 for the balls that were inside the zip-lock). The balls appeared to have been dyed green. The exhibits were seized in Warren County by the Missouri State Highway Patrol, pursuant to a consent and subsequent canine search of a vehicle (Warren County is about 60 miles west of St. Louis). Analysis of the plant material (total net mass 0.82 grams) by microscopy, TLC, and Modified Duquenois-



**Photo 1**

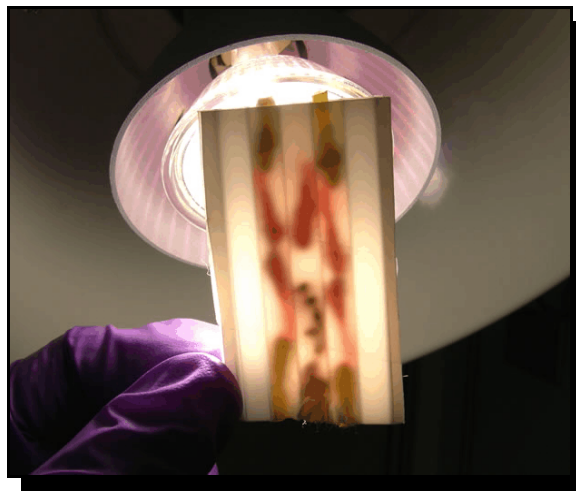
Levine confirmed marijuana. Analysis of the balls (total net mass 148.7 grams) by TLC and GC/MS, however, indicated not marijuana or THC but rather psilocin (not quantitated). Closer examination of the balls indicated mushroom material mixed into the grains. This is the first submission of *Psilocybe* mushrooms in this form to the laboratory.

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**- INTELLIGENCE ALERT -**

**PACKAGE OF PRESUMED MARIJUANA SEEDS (FOR “FEMINIZED BC BUD HASH PLANTS”) IN LAUREL, MARYLAND**

The Maryland State Police - Forensic Sciences Division Laboratory (Pikesville) recently received two white plastic rectangular packages with pink and yellow tubes sticking out of the ends, each containing five small seeds interspaced between multiple cotton tip swabs, suspected marijuana seeds (see Photos 2 - 4). The packages were seized by the Howard County Police Department at an inactive marijuana grow operation in Laurel, Maryland (located midway between Baltimore and Washington, DC); many other marijuana exhibits were also seized. Both packages were labelled as “BCFH.” Holding each package against a bright light showed five internal compartments with five dark items all together in the central compartment (see Photo 2). Opening the package revealed the seeds and multiple cotton tip swabs (see Photo 3). Because of the large number of other marijuana exhibits, the seeds (see Photo 4) were not analyzed or germinated; however, an internet search led to a marijuana grow website, which indicated that the seeds were for “Feminized BC Bud Hash” plants. The purpose of the cotton swab tips is not known, but they may have been in the packages to prevent germination. This is the first submission of this type to the laboratory.



**Photo 2**



**Photo 3**



**Photo 4**

**- INTELLIGENCE ALERT -**

**POLY-DRUG SEIZURE OF HALLUCINOGENS IN  
UPPER DARBY TOWNSHIP, PENNSYLVANIA**

The Pennsylvania State Police Crime Laboratory in Lima, Pennsylvania, recently received a poly-drug submission consisting of: A) 42 round green tablets marked with the Batman logo on one face and half-scored on the reverse face, suspected MDMA (see Photo 5); B) 20 round white tablets marked with “G.” on one face and a reclining woman logo on the reverse face, suspected MDA (see Photo 6); C) Four squares of white blotter paper, suspected LSD (no photo); D) Two bags of white powder, submitted as an unknown (no photo); and E) 29 clear capsules containing white or off-white solids, also submitted as an unknown. The exhibits were seized in three separate but related operations in Upper Darby Township (near Philadelphia) by the Upper Darby Township Police (no further details).



**Photo 5**



**Photo 6**

Analysis of the green tablets (total net mass 14.9 grams) by GC/MS, however, indicated not MDMA but rather a 1 : 1 mixture of caffeine and 3,4-methylenedioxymethylnitrostyrene (an intermediate in the synthesis of MDA or 3,4-methylenedioxyphenyl-2-propanone). When tested with the Marquis reagent, the samples from the green tablets turned black, but the color did not spread into the liquid. Analysis of the white tablets (total net mass 6.2 grams) by Marquis and GC/MS confirmed MDA (not quantitated). Analysis of the blotter paper by Ehrlich's and GC/MS confirmed LSD (not quantitated). Analysis of the first bag of powder (total net mass 0.53 grams) by GC/MS and IR indicated ketamine (not quantitated). However, analysis of the second bag of powder (total net mass 0.21 grams) by GC/MS and microcrystal testing indicated dextromethorphan (not quantitated). Analysis of the capsules by GC indicated four different drugs: 1) 19 capsules (total net mass 0.95 grams) contained 2,5-dimethoxy-4-ethylamine (2C-E, not quantitated, see Photo 7 (Photos 7 - 10 next page)); 2) six capsules (total net mass 0.71 grams) contained 5-methoxy-N,N-diisopropyltryptamine (5-MeO-DIPT, also known as Foxy-Methoxy, not quantitated, see Photo 8); 3) three capsules (total net mass 0.36 grams) contained 2,5-dimethoxy-4-bromophenethylamine (2C-B, also known as Nexus, not quantitated, see Photo 9); and 4) one capsule (total net mass 0.10 grams) contained 5-methoxy-N,N-dimethyltryptamine (5-MeO-DMT, not quantitated, see Photo 10).

This was the first submission of 5-MeO-DIPT, 5-MeO-DMT, 2C-B, 2C-E, and 3,4-methylenedioxymethylnitrostyrene to the laboratory. The large variety of drugs in this case was unusual.





**Photo 7**



**Photo 8**



**Photo 9**



**Photo 10**

\* \* \* \* \*

**- INTELLIGENCE ALERT -**

**LSD BLOTTER ACID MIMIC (ACTUALLY CONTAINING A MIXTURE OF  
4-CHLORO-2,5-DIMETHOXYAMPHETAMINE (DOC) AND  
4-iodo-2,5-DIMETHOXYAMPHETAMINE (DOI)) IN PADUCAH, KENTUCKY**

The Kentucky State Police Western Laboratory Branch (Madisonville) recently received a single white square of blotter paper, wrapped in foil, suspected LSD (photo not taken). The exhibit was acquired by the Paducah Police from a cooperating source. The square was approximately ¼-inch by ¼-inch, and was unmarked. Analysis of a methanolic extract by GC/MS, however, indicated not LSD but rather a mixture of 4-chloro-2,5-dimethoxyamphetamine (DOC) and 4-iodo-2,5-dimethoxyamphetamine (DOI). The DOC and DOI were not formally quantitated, but were present in a moderate loading in a 2.2 : 1 ratio, based on a secondary GC/FID analysis. This was the first submission of either DOC or DOI to the laboratory.

**- INTELLIGENCE ALERT -**

**PSILOCYBE MUSHROOMS IN NILES, OHIO**

The Ohio Bureau of Criminal Identification and Investigation - Richfield Laboratory recently received a shipping box containing two large plastic bags, each containing “vegetation” (total net mass 2288 grams), suspected *Psilocybe* mushrooms (see Photo 11). The box had been mailed from the U.S. west coast and was seized by the Niles Police at a local mail-handling facility (Niles is a northern suburb of Youngstown). Following basic workup, analysis of an ether extract of the material (reconstituted in chloroform) by GC/FID and GC/MS confirmed psilocin. The laboratory has previously received *Psilocybe* mushrooms, but this was an unusually large submission.



**Photo 11**

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**- INTELLIGENCE ALERT -**

**HEROIN IN A LAPTOP COMPUTER AND POWER SUPPLY (FROM COLOMBIA)  
AT MIAMI INTERNATIONAL AIRPORT**

The DEA Northeast Laboratory (New York, New York) recently received a non-operational laptop computer and power supply containing a total of six packages of beige powder, suspected heroin (see Photo 12). The exhibits were seized by Immigration and Customs Enforcement personnel from a passenger who arrived at Miami’s International Airport from a flight originating in Colombia. Five of the packages were concealed in the computer, while the sixth was in the power supply. Analysis of the powder (total net mass 746.6 grams) by GC/FID, GC/MS, NMR, and FTIR/ATR confirmed 56.5 percent heroin hydrochloride, adulterated with diltiazem (not quantitated). This was the second submission of heroin in a laptop computer to the Northeast Laboratory; however, the first submission was in a partially operational laptop (which was highly unusual; see: Heroin Smuggled from Bogota to Miami in an Operational Laptop Computer. Microgram Bulletin 2008;41(1):3). The laboratory has previously encountered heroin adulterated with diltiazem.



**Photo 12**

**- INTELLIGENCE BRIEF -**

**DIMETHYLAMPHETAMINE IN “ICE”-LIKE FORM IN UDORN, THAILAND**

The DEA Special Testing and Research Laboratory (Dulles, Virginia) recently received an exhibit of clear, colorless crystals, suspected “Ice” methamphetamine (see Photo 13). The exhibit was sampled from a 2 kilogram seizure made by the Narcotics Suppression Board/Korat in Udorn, Thailand. Analysis of the material (total net mass 0.28 grams) by GC/FID, GC/MS, FT/NMR, and FTIR/ATR, however, indicated not methamphetamine but rather 98.5 percent N,N-dimethyl-amphetamine hydrochloride. This was the first submission of dimethylamphetamine in “Ice”-like form to the Special Testing and Research Laboratory.



**Photo 13**

[Editor's Notes: Similar exhibits have been submitted domestically to the DEA Western and DEA South Central Laboratories; see: (A) Dimethylamphetamine in Apparent “Ice”-Form Near Medford, Oregon. Microgram Bulletin 2004;37(11):195; and (B) Dimethylamphetamine in “Ice”-Like Form in Florence, Alabama. Microgram Bulletin 2005;38(2):33.]

\* \* \* \* \*

**- INTELLIGENCE ALERT -**

**VIALS OF FREEZE-DRIED HUMAN GROWTH HORMONE (HGH)  
IN EAST MEADOW, NEW YORK**

The DEA Mid-Atlantic Laboratory (Largo, Maryland) recently received 2 boxes, both labelled “S.I.U.G.,” and each containing 10 clear glass vials of a white powder, alleged to be freeze-dried human growth hormone (HGH, see Photo 14). The vials were seized in East Meadow, New York, by the Nassau County Police, and were submitted to the laboratory after a controlled delivery in Virginia by Special Agents from the DEA Washington, DC District Office. Analysis of the powder (total net mass 0.80 grams in the 20 vials) by MS, FTIR, LC, and LC/MS indicated HGH (not confirmed). This is the first submission of alleged freeze-dried HGH to the Mid-Atlantic Laboratory.



**Photo 14**

[Editor's Note: An Internet search indicates that S.I.U.G. is an underground laboratory operating in the New York area, specializing in anabolic steroids, HGH, and similar products.]



**- INTELLIGENCE ALERT -**

**QUETIAPINE IN HEROIN IN DETROIT, MICHIGAN**

The DEA North Central Laboratory (Chicago, Illinois) recently received an exhibit of suspected heroin, purchased during an ongoing DEA investigation (details sensitive). Analysis of the sample (total net mass 1.2 grams, photo not taken) by GC/MS, IR, and GC/FID confirmed 11.3 percent heroin hydrochloride, caffeine, lidocaine (salt undetermined), diphenhydramine (salt undetermined), benzocaine, quinine (salt undetermined), and an unknown that eluted approximately 2 minutes after quinine. A mass spectral library search indicated that the unknown was quetiapine (subsequently confirmed via GC/MS comparison with a standard). Quetiapine (trade name Seroquel) is a prescription medication used in the treatment of schizophrenia. The quetiapine was not formally quantitated; however, it was between 1 and 5 percent based on the TIC. While this is not the first instance of quetiapine in a submission to the North Central Laboratory, it is not commonly seen as an adulterant in heroin.

\* \* \* \* \*

**- INTELLIGENCE ALERT -**

**N-ISOPROPYLBENZYLAMINE HYDROCHLORIDE (AS “ICE”  
METHAMPHETAMINE MIMICS) ON THE WEST COAST**

The DEA Western Laboratory (San Francisco, California) recently received exhibits from three unrelated seizures, each containing apparent “Ice” methamphetamine (e.g., see Photo 15), that was subsequently identified as pure N-isopropylbenzylamine hydrochloride.

The first exhibit was submitted by the DEA Fresno Resident Office (California), and was seized from a vehicle in Bakersfield (no further information). The exhibit consisted of 15 plastic snap-top containers wrapped in black 10 mil PVC tape, all containing large white crystals. Analysis of the crystals (total net mass 6723 grams) by Raman, FTIR-ATR, GC/FID, and GC/MS identified N-isopropylbenzylamine hydrochloride.



**Photo 15**

The second exhibit was submitted by the DEA Salem Resident Office (Oregon), and was seized in Salem by the Oregon State Police, along with 21 kilogram bricks of cocaine hydrochloride (no further information). The exhibit consisted of two rectangular, plastic snap-top containers, both containing large, white crystals. Analyses of the crystals (total net mass 891.0 grams) by Marquis color test (slight orange to brown color transition), FTIR-ATR, and GC/MS again identified N-isopropylbenzylamine hydrochloride.

The third submission was submitted by the DEA Sacramento District Office (California), and was seized near Redding as a result of a domestic highway enforcement program by the Tehama County Sheriff's Department (no further information). The exhibit consisted of five plastic snap-top containers, each wrapped in white plastic shopping bags and clear plastic, with automotive grease and coffee grounds layered on the inner layers, all containing large, white crystals. Analyses of the crystals (total net mass 2230 grams) by Marquis color test, FTIR-ATR, and GC/MS again identified N-isopropylbenzylamine hydrochloride.

[Editor's Notes: In addition to the anomalous Marquis results, it was noted by the analysts that the N-isopropylbenzylamine hydrochloride crystals grind much easier than similar sized "Ice" methamphetamine crystals. N-Isopropylbenzylamine hydrochloride is not controlled, and does not have CNS stimulant effects at typical methamphetamine dosage levels. N-Methylbenzylamine and N-ethylbenzylamine have also been used as "Ice" methamphetamine mimics; see: Microgram Bulletin 2007;40(8):79.]

\* \* \* \* \*

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[The Selected References section is a compilation of recent publications of presumed interest to forensic chemists. Unless otherwise stated, all listed citations are published in English. Abbreviated mailing address information duplicates that provided by the abstracting service. Patents and Proceedings are reported only by their *Chemical Abstracts* citation number.]

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counterfeit tablets and also Viagra mimic tablets (usually containing amphetamine or methamphetamine) have occasionally been submitted as suspected controlled substances to forensic laboratories.]

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## SCIENTIFIC MEETINGS

**Title:** 30th Annual SWAFS Meeting (First Bimonthly Posting)  
**Sponsoring Organization:** Southwestern Association of Forensic Scientists  
**Inclusive Dates:** September 22-26, 2008  
**Location:** The Peabody, Little Rock (Little Rock, Arkansas)  
**Contact Information:** Nick Dawson (501/683-6189 or [nick.dawson -at- crimelab.arkansas.gov](mailto:nick.dawson@crimelab.arkansas.gov))  
**Website:** [www.swafs.us](http://www.swafs.us)

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# Microgram

## *Bulletin*

**Published by:**

The Drug Enforcement Administration  
Office of Forensic Sciences  
Washington, DC 20537

The U.S. Attorney General has determined that the publication of this periodical is necessary in the transaction of the public business required by the Department of Justice. Information, instructions, and disclaimers are published in the January issues.

- APRIL 2008 -

**- INTELLIGENCE ALERT -**

**RECORD SEIZURE OF *PSILOCYBE* MUSHROOMS  
IN POTTAWATTAMIE COUNTY, IOWA**

The Iowa Criminalistics Laboratory (Ankeny) recently received 199 large zip-lock plastic bags of dried mushrooms, suspected *Psilocybe* mushrooms (see Photo 1). The exhibits, originally packed in various boxes and large garbage bags, were seized by the Iowa State Patrol pursuant to a traffic stop of a large pickup truck on Interstate 80 in Pottawattamie County (southwestern Iowa). Analysis of the mushrooms (total net mass 92.96 kilograms) by TLC and GC/MS confirmed psilocin and psilocybin at a typical levels (not formally quantitated). This is the largest ever seizure of dry *Psilocybe* mushrooms in Iowa.



**Photo 1**



**- INTELLIGENCE ALERT -**

**AROMATHERAPY OIL (ACTUALLY CONTAINING A STEROID COCKTAIL)  
IN HUMMELSTOWN, PENNSYLVANIA**

The Pennsylvania State Police, Bureau of Forensic Services, Harrisburg Regional Laboratory recently received a small package of purported aromatherapy oil, suspected to contain a mixture of anabolic steroids (see Photo 2). The package was seized at the residence of a known steroid abuser in Hummelstown (a small town between Harrisburg and Hershey), pursuant to a consent search by the Hummelstown Borough Police. The suspect in the case admitted to steroid abuse and indicated that the package actually contained “Sustanon” (which is a steroid cocktail containing the following testosterone esters: Propionate 30 milligrams, phenylpropionate 60 milligrams, isocaproate 60 milligrams, and decanoate 100 milligrams). The package markings included the website “821.in,” and indicated that the contents were Indian Aromatherapy Oils. The oil fluoresced when concentrated sulfuric acid was added and the resulting mixture was subjected to UV irradiation. Analysis of a methanol extract of the oil (total net volume 3.1 milliliters) by GC/MS confirmed testosterone propionate, cypionate, and decanoate in an approximate 4 : 3 : 1 ratio based on the TIC. The results indicated that the oil was not actually “Sustanon,” but rather a substitute or mimic steroid cocktail. This was the first submission of this type of packaging encountered anywhere within the Pennsylvania State Police Crime Laboratory system.



**Photo 2**

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**- INTELLIGENCE ALERT -**

**VERY LARGE SEIZURE OF N-ISOPROPYLBENZYLAMINE  
HYDROCHLORIDE IN BAKERSFIELD, CALIFORNIA**

The DEA Western Laboratory (San Francisco, California) recently received 11 gallon-sized zip lock bags and two plastic containers, all containing white crystalline materials, presumed “Ice” methamphetamine (see Photos 3 and 4, next page). The exhibits were seized by DEA Special Agents from within a hidden electronic compartment in a van during a buy-bust operation in Bakersfield, California. Analysis of the crystals in one zip lock bag (total net mass 432.7 grams) by Raman, GC/MS, NMR, ATR, GC/IRD, LC/MS/MS, and CE identified 1.3 percent methamphetamine (isomer and salt undetermined) and N-isopropylbenzylamine hydrochloride



**Photo 3 (Ruler is 12 Inch)**

(HCl; not quantitated but high purity). Analysis of the crystals in three zip lock bags (total net mass 1309 grams) by Raman, GC/MS, GC/FID, and ATR identified N-isopropylbenzylamine HCl (not quantitated but high purity) and trace dimethylsulfone. Analysis of the crystals in the other seven zip lock bags and the two containers (total net mass 3943 grams) by Raman, GC/MS, GC/FID, and ATR identified N-isopropylbenzylamine HCl (not quantitated but high purity). To date, this is the largest seizure of N-isopropylbenzylamine HCl submitted to the Western Laboratory.



**Photo 4**

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### **- INTELLIGENCE ALERT -**

### **OXYCODONE TABLETS SMUGGLED IN “D” BATTERIES IN WARWICK, RHODE ISLAND**

The DEA Northeast Laboratory (New York, New York) recently received four “D”-cell batteries, each packed with 12 short, aligned sections of plastic straws containing in total 624 orange colored tablets, suspected oxycodone (see Photo 5). The exhibits were seized in Warwick, Rhode Island, by personnel from the New England HIDTA Office (no further details). The tablets (total net mass 82.7 grams) were marked with a “40” on one face and an “EX” on the opposite face, and appeared to be a legitimate pharmaceutical product. Analysis by GC/MS, TLC, HPLC, GC/FID, and FTIR/ATR confirmed 41.4 milligrams of oxycodone per tablet (calculated as the hydrochloride). The Northeast Laboratory routinely receives tablets concealed in various materials, but this is the first submission of oxycodone tablets in “D”-cell batteries.

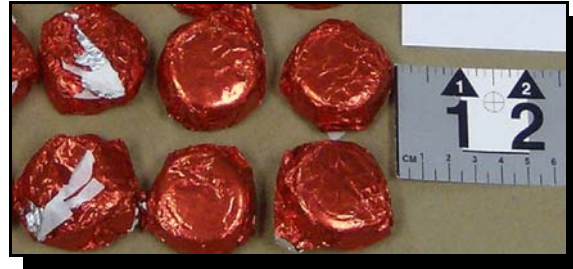


**Photo 5**

**- INTELLIGENCE ALERT -**

**CHOCOLATES CONTAINING TRIFLUOROMETHYLPHENYLPIPERAZINE (TFMPP) IN JACKSONVILLE, FLORIDA**

The DEA Southeast Laboratory (Miami, Florida) recently received 75 chocolates, purported to contain psilocybin (see Photo 6). The exhibits were obtained in Jacksonville, Florida, by a Jacksonville Sheriff's Office confidential source (details sensitive). Each chocolate had a smiley face on one side (see Photo 7), and was wrapped in red foil over wax paper. Visual inspection and subsequent workup did not indicate any mushroom parts in the chocolate. Analysis of methanol extracts of the chocolates (total net mass 1.2 kilograms) by GC/MS and GC/FID indicated not psilocybin (or psilocin) but rather 1-[3-(trifluoromethyl)phenyl]piperazine (TFMPP; not quantitated). This is the first known submission of chocolates containing TFMPP to the Southeast Laboratory .



**Photo 6**



**Photo 7**

[Editor's Notes: TFMPP has some MDMA mimicking properties, and is commonly abused as such, usually in combination with benzylpiperazine (BZP). It was emergency scheduled (Schedule I) from September 2002 til March 2004; however, it is currently (April, 2008) not controlled.]

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**- INTELLIGENCE ALERT -**

**LARGE SEIZURE OF MDMA POWDER AT THE HIDALGO, TEXAS PORT OF ENTRY**

The DEA South Central Laboratory (Dallas, Texas) recently received two plastic packages containing a light brown powder that field-tested positive for heroin (see Photo 8). The exhibits were taped to the inner thighs of a male pedestrian attempting to enter the U.S. at the Hidalgo, Texas Port of Entry, and were seized by Immigration and Customs Enforcement personnel. Analysis of the powder (total net mass 1970.3 grams) by GC/MS, FTIR, NMR, and HPLC, however, indicated not heroin but rather 95.9 percent MDMA hydrochloride (HCl). This is the second largest ever submission of MDMA HCl powder to the South Central Laboratory.



**Photo 8**

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**- INTELLIGENCE ALERT -**

**METHAMPHETAMINE BRICKS AT THE OTAY MESA, CALIFORNIA  
PORT OF ENTRY**

The DEA Southwest Laboratory (Vista, California) recently received a two-part submission consisting of: A) seven heat-sealed food-saver bags of crystalline material, apparent “Ice” methamphetamine, wrapped in black carbon paper, blue-colored grease, and plastic wrap; and B) 12 heat-sealed food-saver bags, each containing a small brick of compressed, off-white material, wet with toluene, wrapped in brown plastic tape, black plastic tape, and plastic wrap, suspected methamphetamine. The exhibits (see Photo 9) were seized by Immigration and Customs Enforcement personnel pursuant to a vehicle search at the Otay Mesa, California Port of Entry. Analysis of the crystalline material (total net mass 3068 grams) by GC, GC/MS, LC, and IR confirmed 95.1 percent d-methamphetamine hydrochloride. The bricks were approximately 4.5 inches square and 1.5 inches thick; six bricks had an impression of “Hecho en Mexico” (“Made in Mexico”) over and under an eagle head logo (see Photo 10), while the other six bricks had an impression of the face of a smiling monkey (see Photo 11). The latter design has been previously seen at the Southwest Laboratory, but always in such poor quality as to make a positive identification impossible. All 12 blocks had a rounded edge and a broken edge, and physical matching of the broken edges confirmed that the 12 small bricks were actually six larger bricks that had been broken in half, each reconstructed brick being approximately 9 inches long and 1.5 inches thick, with the “Hecho en Mexico” impression on one half and the smiling monkey impression on the other half. Analysis of the compressed material (total net mass 6115 grams after evaporation of the toluene) by GC, GC/MS, LC, and IR confirmed 95.6 percent d-methamphetamine hydrochloride. It is unclear why the bricks were broken in halves. The Southwest Laboratory has previously received similar bricks of compressed methamphetamine.



**Photo 9**



**Photo 10**



**Photo 11**

## SELECTED REFERENCES

[The Selected References section is a compilation of recent publications of presumed interest to forensic chemists. Unless otherwise stated, all listed citations are published in English. Abbreviated mailing address information duplicates that provided by the abstracting service. Patents and Proceedings are reported only by their *Chemical Abstracts* citation number.]

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3. Hamano T, Shioda H, Nakajima J, Yasuda I. **Analysis of psychotropic components in commercial botanical drugs.** Tokyo-to Kenko Anzen Kenkyu Senta Kenkyu Nenpo 2006;57:121-126. [Editor's Notes: The abstract is unclear - although analysis of a number of "botanical drugs" is implied, only Salvinorin A is specified. Analytical techniques included TLC, LC/PDA, LC/MS, and GC/MS. This article is written in Japanese. Contact: Med. Pharm. Div., Tokyo Metropolitan Institute of Public Health, Tokyo, Japan 169-0073.]
4. Huhn C, Puetz M, Holthausen I, Pyell U. **Separation of very hydrophobic analytes by micellar electrokinetic chromatography. I. Optimization of the composition of the sample solution for the determination of the aromatic ingredients of sassafras and other essential oils of forensic interest.** Electrophoresis 2008;29(2):526-537. [Editor's Notes: Used an MEKC method with UV and LIF detection; the detection of minor constituents in essential oils was possible despite of the presence of a structurally related compound in a molar ratio excess of 1000:1 (emphasis was analysis of allylbenzenes). Contact: Department of Chemistry, University of Marburg, Marburg, Germany.]
5. Kuwayama K, Inoue H, Phorachata J, Kongpatnitiroj K, Puthaviriyakorn V, Tsujikawa K, Miyaguchi H, Kanamori T, Iwata YT, Kamo N, Kishi T. **Comparison and classification of methamphetamine seized in Japan and Thailand using gas chromatography with liquid-liquid extraction and solid-phase microextraction.** Forensic Science International 2008;175(2-3):85-92. [Editor's Notes: 14 characteristic peaks were selected for comparative analysis, and the data were evaluated by the Euclidean distance of the relative peak areas after logarithmic transformation. 69 samples seized in Japan and 42 seized in Thailand were analyzed, and classified into 4 groups roughly by cluster analysis. SPME made it easy to compare samples of high purity. Contact: National Research Institute of Police Science, 6-3-1, Kashiwanoha, Kashiwa, Chiba 277-0882, Japan.]
6. Nakamoto A, Namera A, Yahata M, Kuramoto T, Nishida M, Yashiki M. **A systematic toxicological analysis for hallucinogenic tryptamines in seized and biological materials.** Hiroshima Daigaku Igaku Zasshi 2007;55(1-3):1-14. [Editor's Notes: Screening of powders was carried out using Simon's, Marquis, and Ehrlich's reagents. It was possible to distinguish between 24 abused drugs (various stimulants and psychotropic drugs, not specified in the

abstract). Similar colors were noted for compounds with similar substitution patterns on the indole rings. The rest of the article was focused on urinalyses. This article is written in Japanese. Contact: Dep. Legal Med., Grad. Sch. Biomed. Sci., Hiroshima University, Japan.]

7. Odell LR, Skopec J, McCluskey A. **Isolation and identification of unique marker compounds from the Tasmanian poppy *Papaver somniferum* N.** Forensic Science International 2008;175(2-3):202-208. [Editor's Notes: Tasmanian opium poppies contain a unique alkaloid, oripavine, which is the source of various marker impurities in illicit heroin produced from Tasmanian poppy straw. Four of these marker compounds were identified in seized heroin samples from Australia, suggesting that they were of Tasmanian origin. Complete details of the isolation and identification of these compounds are provided. Contact: Chemistry Building, School of Environmental and Life Sciences, The University of Newcastle, Callaghan NSW 2308, Australia.]
8. Pozo OJ, Van Eenoo P, Deventer K, Delbeke FT. **Ionization of anabolic steroids by adduct formation in liquid chromatography electrospray mass spectrometry.** Journal of Mass Spectrometry 2007;42(4):497-516. [Editor's Notes: The ionization of 46 anabolic steroids is presented. Different mobile phases using methanol or acetonitrile and HCOOH, Na<sup>+</sup> or NH<sub>4</sub><sup>+</sup> as additives were shown to favor adduct formation. The anabolic steroids could be divided into seven different groups depending on both the nature and the relative position of their functional groups. Contact: DoCoLab, Department of Clinical Chemistry, Microbiology and Immunology, UGent, B-9052 Zwijnaarde, Belg.]
9. Shi Y-Q, Yao J, Liu F, Hu C-Q, Yuan J, Zhang Q-M, Jin S-H. **Establishment of an HPLC identification system for detection of counterfeit steroidal drugs.** Journal of Pharmaceutical and Biomedical Analysis 2008;46(4):663-669. [Editor's Notes: A set of simple HPLC methods employing UV detection were developed for detection of counterfeit drugs by the qualitative and quantitative analysis of 9 steroids: Ethinylestradiol, diethylstilbestrol, norethisterone, norgestrel, methyltestosterone, medroxyprogesterone acetate, progesterone, testosterone propionate, and nilestriol. Contact: National Institute for Control of Pharmaceutical and Biological Products, 2 Tiantan Xili, Beijing 100050, Peop. Rep. China.]

#### Additional References of Possible Interest:

1. Chen X, Lian Y, Li A, Li J, Liu G, He C, Wu X, Wang H, Li H. **An intelligent recognition program for in-situ detection of illicit chemicals by ion mobility spectrometry.** Jisuanji Yu Yingyong Huaxue 2007;24(9):1145-1148. [Editor's Notes: The recognition rate was 90%. The "illicit chemicals" were not detailed in the abstract. This article is written in Chinese. Contact: Dalian Institute of Chemical Physics, Chinese Academy of Sciences, Dalian 116023, Peop. Rep. China.]
2. Funada M. **Uncontrolled newly-abused drugs (law-evading drugs).** Nippon Yakurigaku Zasshi 2007;130(5):433-435. [Editor's Notes: A review of the health hazards of new designer drugs, and legal regulation and prevention of their use. This article is written in Japanese. Contact: National Institute of Mental Health, National Center of Neurology and Psychiatry, Kodaira, Japan 187-8553.]
3. Huo Y, Kok WT. **Recent applications in CEC.** Electrophoresis 2008;29(1):80-93. [Editor's Notes: A review, covering applications in CEC between May 2005 and May 2007; including 2-D systems and nano- and microfluidic devices. Contact: Polymer-Analysis Group, van't Hoff Institute for Molecular Sciences, University of Amsterdam, Amsterdam, Neth.]



4. Tagliaro F, Bortolotti F. **Recent advances in the applications of CE to forensic sciences (2005-2007)**. *Electrophoresis* 2008;29(1):260-268. [Editor's Notes: A review, covering applications of CE in forensic science covering the period from 2005 until the first part of 2007. Contact: Department of Medicine and Public Health, Section of Forensic Medicine, University of Verona, Verona, Italy.]

\* \* \* \* \*

## THE JOURNAL/TEXTBOOK COLLECTION EXCHANGE

The Journal/Textbook Collection Exchange is a service intended to facilitate the transfer of unwanted journals and textbooks to forensic libraries or other *Microgram* subscribers. At present, this service is offered once a quarter (in January, April, July, and October). The current donations are listed below. The offers are First Come/First Serve (except **libraries have preference**). There are no charges to the requestor. Please provide a full mailing address in the request. **Important!:** Do not provide an address that irradiates mail!

### *Journal of Forensic Sciences:*

1992 - All

1993 - January (#1, 2 Copies), March (#2), July (#4), September (#5), and November (#6)

1994 - March (#2), May (#3), and July (#4)

2005 - May (#3) and July (#4)

**All subscribers are encouraged to donate surplus or unwanted items/collections.** Reference texts and long runs of forensic/analytical journals are of particular interest; however, even single issues are worthwhile, and may fill a hole in an existing collection. If interested, please consult the *Microgram* website or contact the *Microgram* Editor for further instructions.

The next offering of journals and textbooks will be in the July 2008 issue of *Microgram Bulletin*.

\* \* \* \* \*

## THE DEA FY 2008 STATE AND LOCAL FORENSIC CHEMISTS SEMINAR SCHEDULE

The remaining FY 2008 schedule for the State and Local Forensic Chemists Seminar is as follows:

May 5 - 9      September 8 - 12

The school is open only to forensic chemists working for law enforcement agencies, and is intended for chemists who have completed their agency's internal training program and have also been working on the bench for at least one year. There is no tuition charge. The course is held at the Hyatt Place Dulles North in Sterling, Virginia (near the Washington/Dulles International Airport). A copy of the application form is reproduced on the last page of the August 2004 issue of *Microgram Bulletin*. (See: <http://www.dea.gov/programs/forensicsci/microgram/mg0804/aug04.pdf>) Completed applications should be mailed to the Special Testing and Research Laboratory (Attention: J. Head) at: 22624 Dulles Summit Court, Dulles, VA 20166. For additional information, call 703/668-3349.

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# Microgram

## *Bulletin*

**Published by:**

The Drug Enforcement Administration  
Office of Forensic Sciences  
Washington, DC 20537

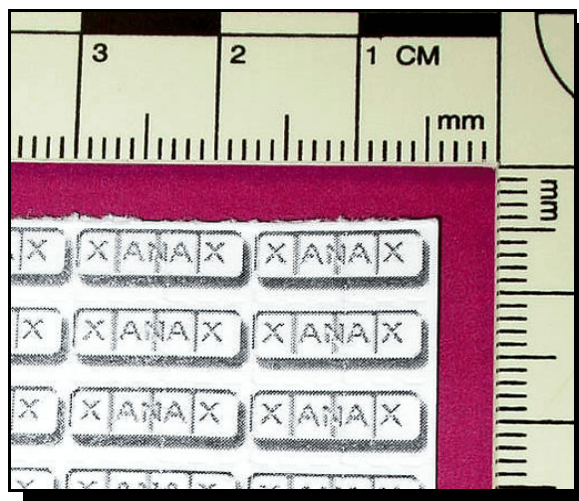
The U.S. Attorney General has determined that the publication of this periodical is necessary in the transaction of the public business required by the Department of Justice. Information, instructions, and disclaimers are published in the January issues.

- MAY 2008 -

**- INTELLIGENCE ALERT -**

### **XANAX BLOTTER PAPER IN BARTLESVILLE, OKLAHOMA**

The Oklahoma State Bureau of Investigation Northeast Regional Laboratory (Tahlequah) recently received a partial sheet of blotter paper, with a Xanax tablet shape with the word "XANAX" inside the tablet shape imprinted repeatedly on one side (see Photo 1) and the word "XANAX" imprinted repeatedly on it in bold letters on the opposite side (photo not shown), suspected LSD. The exhibit was seized in Bartlesville by the Washington County Sheriff's Office, pursuant to a traffic stop for suspected DUI (Bartlesville is in the northeast corner of the state, near Tulsa). The sheet contained 86 dosage units, segmented into 1/4 inch squares. UV irradiation did not give the bright fluorescence usually observed with LSD blotter paper, and analysis of methanolic extracts by GC and GC/MS indicated not LSD but rather alprazolam (not quantitated, but a moderate to high loading based on the chromatograms).



**Photo 1 (12 of 86 Squares)**

A similar submission was previously submitted to the laboratory; however, that exhibit consisted of only two squares, and was imprinted with “XANAX” on only one side. In the latter case, analysis again indicated a heavy loading of alprazolam.

[Editor’s Notes: Xanax is a trade name for alprazolam. Over the past five years, there have been numerous reports of blotter paper laced with drugs other than LSD, usually designer tryptamines and phenethylamines. However, use of benzodiazepines (such as alprazolam) for this purpose is unusual. Submissions of blotter paper actually containing LSD are currently uncommon.]

\* \* \* \* \*

### **- INTELLIGENCE ALERT -**

#### **MDMA INSIDE A MARIJUANA “BLUNT” IN BATON ROUGE, LOUISIANA**

The Louisiana State Police Crime Laboratory in Baton Rouge recently received a plastic bag of marijuana (confirmed), two green Ecstasy-type tablets (MDMA confirmed), and a hand-rolled cigar, an apparent marijuana “blunt.” The exhibits were seized in Baton Rouge by the Baton Rouge Police (no further details). The cigar was approximately 9 x 1 centimeters, weighed 1.68 grams, and was visually unremarkable. However, upon disassembly for sampling purposes, the core was found to contain a sprinkling of pink granules, apparently a crushed up tablet, mixed throughout the plant material (see Photos 2a and b). Analysis of the plant material by microscopy and Duquenois-Levine confirmed marijuana (THC not quantitated). Analysis of the pink substance (not weighed separately) by GC and GC/MS indicated MDMA, caffeine, and procaine (MDMA not quantitated, but much less than the caffeine and procaine). This is believed to be the second such submission to the laboratory.



**Photo 2a**



**Photo 2b - Expansion of Left-Center Section of Photo 2a**

**- INTELLIGENCE ALERT -**

**“READY TO USE” VIALS OF INJECTABLE HEROIN SOLUTIONS  
IN FARAH PROVINCE, AFGHANISTAN**

The DEA Special Testing and Research Laboratory (Dulles, Virginia) recently received several submissions of sealed injection vials, each containing approximately 2 milliliters of yellow to golden colored liquids, purported heroin solutions (see Photo 3). The exhibits were seized by the Afghanistan Special Narcotics Force (ASNF) and DEA personnel at a residential complex in Farah Province, Afghanistan (located in the western part of the country, bordering Iran). In all, about 25 of the vials were submitted for analysis (there were over 200,000 such vials at the complex). Analysis via GC/FID, GC/MS, NMR, FTIR-ATR, and CE confirmed that the liquids were solutions of heroin hydrochloride in water (pH 4 - 5), varying from trace to 13 milligrams/milliliter (most were between 12 - 13 milligrams/milliliter). O6-Monoacetylmorphine was the primary component in solutions with low heroin concentrations, and it appears that in these cases the heroin hydrolyzed before the solution was analyzed. Pheniramine and caffeine were also found in some of the solutions. Based on investigative intelligence, it is believed that the vials were prepared as “ready-to-use” injectable heroin solutions. These were the first submissions of this type to the Special Testing and Research Laboratory.



**Photo 3**

\* \* \* \* \*

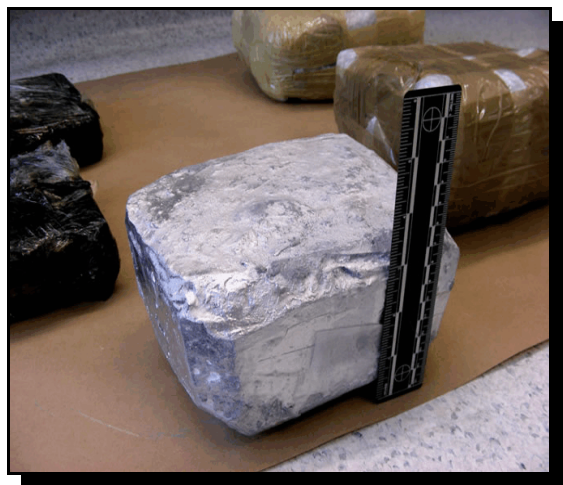
**- INTELLIGENCE ALERT -**

**COCAINE AND HEROIN SMUGGLED IN COMPOSITE “ROCKS”**

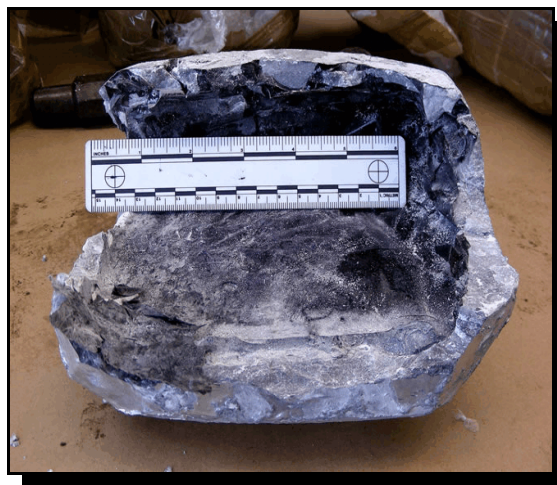
The DEA North Central Laboratory (Chicago, Illinois) recently received 3 separate exhibits containing a total of 18 apparent rocks, 16 of which contained powders that field-tested positive for cocaine, and two of which contained powders that field-tested positive for heroin (see Photo 4, next page). The exhibits were seized by Immigration and Customs (ICE) personnel (locations and details sensitive). The rocks were about the size of footballs, weighed about 4 kilograms each, were spray-painted silver, and were wrapped in plastic tape and bubble wrap (see unopened packages in Photo 4). The field-testing samples were acquired by ICE personnel by drilling into the rocks. At the laboratory, the rocks were easily cracked open in a vice, revealing a gray layer, a black layer, and a wrapped package of powder (see Photo 5). The gray material appeared to be a form of granite composite (the type used in production of countertops). The black layer was epoxy. The powders were variably packaged in plastic wraps, grease, carbon paper, plastic mesh, and/or tan tape. The first exhibit (16 rocks) contained a net total of 5.9 kilograms of off-white powder; analysis by GC/MS, IR, and GC/FID confirmed 59.6 percent cocaine hydrochloride adulterated with 0.5 - 2 percent levamisole. The second exhibit (1 rock) contained 1.0 kilogram of tan powder; analysis by GC/MS, IR, and GC/FID confirmed 84.1 percent heroin hydrochloride. The third exhibit (1 rock) contained 998 grams of tan powder;



analysis by GC/MS, IR, and GC/FID confirmed 79.9 percent heroin hydrochloride. This was the first submission of this smuggling technique to the North Central Laboratory.



**Photo 4**



**Photo 5**

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**- INTELLIGENCE ALERT -**

**ECSTASY COMBINATION TABLETS (CONTAINING MDMA,  
METHAMPHETAMINE, BZP, TFMPP, DIBENZYLPIPERAZINE,  
CAFFEINE, AND PROCAINE) IN NORFOLK, VIRGINIA**

The DEA Mid-Atlantic Laboratory (Largo, Maryland) recently received 705 yellow tablets with a Superman logo, suspected MDMA (see Photo 6). The exhibits were seized at a mail distribution facility in Norfolk, Virginia by the Norfolk Police. Analysis of the tablets (total net mass 198.1 grams) by GC/MS, TLC, and GC confirmed MDMA (10.9 milligrams/tablet), adulterated with methamphetamine (6.1 milligrams/tablet), N-benzylpiperazine (BZP), 1-(3-trifluoromethylphenyl)-piperazine (TFMPP), dibenzylpiperazine, caffeine, and procaine. The three piperazines were not quantitated; however, based on the TIC and GC, the BZP and TFMPP were both higher in concentration than the MDMA and methamphetamine. The tablets also contained MDP2P and piperonal (both indicative of the MDMA synthesis route). The Mid-Atlantic Laboratory has seen a wide variety of Ecstasy combination tablets containing both MDMA and methamphetamine, and a few Ecstasy-mimic tablets containing BZP and TFMPP mixtures, but this is believed to be the first such submission containing all four of these drugs.



**Photo 6**

## - INTELLIGENCE ALERT -

### ***l*-METHAMPHETAMINE IN “ICE”-LIKE FORM IN BILLINGS, MONTANA**

The DEA Western Laboratory (San Francisco, California) recently received two small ziplock-type bag exhibits of white crystals, suspected “Ice” methamphetamine (no photo). The exhibits were acquired in Billings, Montana, by personnel from the Eastern Montana HIDTA (no further details). Analysis of the samples (combined net mass 9.7 grams) by FTIR/ATR, NMR, and GC/MS confirmed methamphetamine hydrochloride (29 and 32 percent, respectively), diluted with dimethylsulfone (not quantitated). However, derivatization with trifluoroacetyl-propyl chloride and GC/FID analysis confirmed that the samples were both *l*-methamphetamine hydrochloride. The Western Laboratory rarely receives exhibits of *l*-methamphetamine.

\* \* \* \* \*

## SELECTED REFERENCES

[The Selected References section is a compilation of recent publications of presumed interest to forensic chemists. Unless otherwise stated, all listed citations are published in English. Abbreviated mailing address information duplicates that provided by the abstracting service. Patents and Proceedings are reported only by their *Chemical Abstracts* citation number.]

1. Elie MP, Baron MG, Birkett JW. **Enhancement of microcrystalline identification of gamma-hydroxybutyrate.** *Journal of Forensic Sciences* 2008;53(1):147-150. [Editor's Notes: An enhancement of the silver nitrate/copper nitrate microcrystal test for gamma-hydroxybutyrate is described. The enhanced test utilizes lanthanum nitrate in place of copper nitrate. Contact: Department of Forensic and Biomedical Sciences, University of Lincoln, Brayford Pool, Lincoln LN6 7TS, UK.]
2. Henderson TJ, Cullinan DB, Lawrence RJ, Oyler JM. **Positive identification of the principal component of a white powder as scopolamine by quantitative one-dimensional and two-dimensional NMR techniques.** *Journal of Forensic Sciences* 2008;53(1):151-161. [Editor's Notes: Presents the in-depth characterization of scopolamine via a wide variety of NMR techniques, including <sup>14</sup>N-NMR. Tandem mass spectra (collision induced dissociation) results are also presented. Contact: U.S. Army Edgewood Chemical Biological Center, MD 21010.]
3. Lai H, Guerra P, Joshi M, Almirall JR. **Analysis of volatile components of drugs and explosives by solid phase microextraction-ion mobility spectrometry.** *Journal of Separation Science* 2008;31(2):402-412. [Editor's Notes: Presents the use of SPME as a pre-concentration technique for detection of drugs and explosives by IMS. “Drugs” specifically mentioned in the abstract are cocaine, marijuana, and MDMA. Contact: Department of Chemistry and Biochemistry, International Forensic Research Institute, Florida International University, FL (zip code not provided).]
4. Matsumoto T, Urano Y, Makino Y, Kikura-Hanajiri R, Kawahara N, Goda Y, Nagano T. **Evaluation of characteristic deuterium distributions of ephedrine and methamphetamines by NMR spectroscopy for drug profiling.** *Analytical Chemistry* 2008;80(4):1176-1181. [Editor's Notes: The quantitative analysis of the deuterium contents (D/H) at the Ph, methine, benzyl, N-Me, and Me groups of *l*-ephedrine/HCl, *d*-pseudoephedrine/HCl and



methamphetamine/HCl by 2H-NMR spectroscopy is described. Comparison of the 5 position-specific D/H values of l-ephedrine/HCl and d-pseudoephedrine/HCl prepared by 3 methods (chemical synthesis, semichemical synthesis, and biosynthesis) showed that the chemically synthesized ephedrine and semisynthetic ephedrine have highly specific distributions of deuterium at the methine and benzyl positions, compared with the other positions. The classification of several methamphetamine samples seized in Japan in terms of the D/H values at these two positions showed that the methamphetamine samples had been synthesized from ephedrine extracted from Ephedra plants or semisynthetic ephedrine and not from synthetic ephedrine. The methodology should be useful for source determination and comparative analysis. Contact: National Institute of Health Sciences, 1-18-1 Kamiyoga, Setagaya-ku, Tokyo, Japan 158-8501.]

5. Potter DJ, Clark P, Brown MB. **Potency of  $\Delta^9$ -THC and other cannabinoids in cannabis in England in 2005: Implications for psychoactivity and pharmacology.** Journal of Forensic Sciences 2008;53(1):90-94. [Editor's Notes: Presents the title survey; analyses were conducted by GC. Contact: Department of Pharmacy, King's College London, 150 Stamford Street, London SE1 9NH, United Kingdom.]
6. Sherma J. **Analysis of counterfeit drugs by thin layer chromatography.** Acta Chromatographica 2007;19:5-20. [Editor's Notes: Presents the title study. Contact: Department of Chemistry, Lafayette College, Easton, PA 18042.]
7. Takahashi M, Nagashima M, Suzuki J, Seto T, Yasuda I, Yoshida T. **Analysis of phenethylamines and tryptamines in designer drugs using gas chromatography - mass spectrometry.** Journal of Health Sciences 2008;54(1):89-96. [Editor's Notes: Presents the title study on 3,4,5-trimethoxyamphetamine, 2,4,5-trimethoxyamphetamine, 4-bromo-2,5-dimethoxy-phenethylamine, 4-iodo-2,5-dimethoxyphenethylamine, 2,5-dimethoxy-4-ethylthiophenethylamine, 2,5-dimethoxy-4-propylthiophenethylamine, 5-methoxy-N,N-dimethyltryptamine, *alpha*-methyltryptamine, N-isopropyl-5-methoxy-N-methyltryptamine, and N,N-diisopropyl-5-methoxytryptamine. 1H- and 13C-NMR data are also included. Contact: Tokyo Metropolitan Institute of Public Health, 3-24-1 Hyakunin-cho, Shinjuku-ku, Tokyo 169-0073, Japan.]
8. Wang M-J, Liu J-T, Chen H-M, Lin J-J, Lin C-H. **Comparison of the separation of nine tryptamine standards based on gas chromatography, high performance liquid chromatography and capillary electrophoresis methods.** Journal of Chromatography, A 2008;1181(1-2):131-136. [Editor's Notes: Presents the title studies on *alpha*-methyltryptamine, N,N-dimethyltryptamine, 5-methoxy-*alpha*-methyltryptamine, N,N-diethyltryptamine, N,N-dipropyltryptamine, N,N-dibutyltryptamine, N,N-diisopropyltryptamine, 5-methoxy-N,N-dimethyltryptamine, and 5-methoxy-N,N-diisopropyltryptamine. Contact: Department of Chemistry, National Taiwan Normal University, Taipei, Taiwan.]

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## SCIENTIFIC MEETINGS

**Title:** 30th Annual SWAFS Meeting (Second Bimonthly Posting)  
**Sponsoring Organization:** Southwestern Association of Forensic Scientists  
**Inclusive Dates:** September 22-26, 2008  
**Location:** The Peabody (Little Rock, Arkansas)  
**Contact Information:** Nick Dawson (501/683-6189 or [nick.dawson-at-crimelab.arkansas.gov](mailto:nick.dawson-at-crimelab.arkansas.gov))  
**Website:** [www.swafs.us](http://www.swafs.us)

# Microgram

## *Bulletin*

**Published by:**

The Drug Enforcement Administration  
Office of Forensic Sciences  
Washington, DC 20537

The U.S. Attorney General has determined that the publication of this periodical is necessary in the transaction of the public business required by the Department of Justice. Information, instructions, and disclaimers are published in the January issues.

**- JUNE 2008 -**

**- INTELLIGENCE ALERT -**

**COCAINE CONCEALED IN RAFFIA HANDBAGS IN PORT OF SPAIN,  
TRINIDAD AND TOBAGO**

The Trinidad and Tobago Forensic Science Centre (Port of Spain) recently received four ladies handbags, each crafted from string-wrapped hollow plastic tubing that contained white powders, suspected cocaine (see Photo 1). The exhibits were seized by Organised Crime Narcotics and Firearms Bureau (OCNFB) personnel at an express mail handling facility in Port of Spain, and were destined for Madrid, Spain (no further details). Each bag contained approximately 32 meters of hollow plastic tubing, all wrapped in colored synthetic raffia string (several different colors); in each case, approximately 21.5 meters of the tubing contained powders (see Photo 2, next page). Analysis of the removed powders (total net mass 909.3 grams) by color testing (Scotts - positive), GC/FID, GC/MS, and FTIR/ATR confirmed 65, 49, 42, and 47 percent cocaine hydrochloride



**Photo 1**

in the four handbags, respectively, all adulterated with caffeine and lactose (not quantitated). This was the first such submission to the laboratory.

[Editor's Notes: Two similar seizures were reported in *Microgram Bulletin* in 2006; see: (A) Cocaine in painted wicker baskets at Miami International Airport. *Microgram Bulletin* 2006;39(2):19; and (B) Cocaine in wicker baskets (from Peru) at the George Bush Intercontinental Airport, Houston, Texas. *Microgram Bulletin* 2006;39(6):72.]

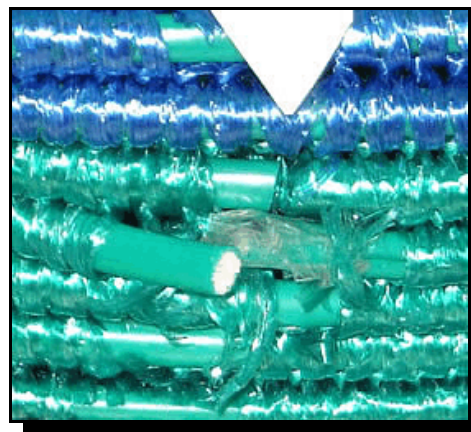


Photo 2

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### - INTELLIGENCE ALERT -

#### **AROMATHERAPY OIL PACKAGE (ACTUALLY CONTAINING TESTOSTERONE CYPIONATE) IN SACRAMENTO, CALIFORNIA**

The Sacramento County District Attorney's Laboratory of Forensic Services (California) recently received four factory-sealed sachets each labelled as "Aromatherapy Oil" and containing approximately 5 milliliters of clear liquid, purported to be an anabolic steroid (see Photo 3). The exhibits were seized at a residence in Sacramento by California Department of Justice Bureau of Firearms personnel, pursuant to a warrant search on firearms charges. During entry, the officers witnessed an individual transferring the contents from one of the sachets into a glass vial by use of a syringe. The individual admitted that the oils in the sachets were steroids that he had purchased over the Internet. Embossed on the edge of each sachet was the code 24100704; investigation indicated that this product is advertised as a "Stealth Injectable," and that the packaging date and contents are embossed in a code on the side of the sachet (in this case, the code corresponded to October 24, 2007, and the last two digits "04" indicated testosterone cypionate). Analysis of a methanolic extract of the oil by GC/MS confirmed testosterone cypionate (not quantitated). This is the first such submission to the laboratory.



Photo 3

[Editor's Note: A similar submission was reported by the Pennsylvania State Police, Bureau of Forensic Services, Harrisburg Regional Laboratory, in the April, 2008 issue of *Microgram Bulletin*. In that case, the "aromatherapy oil" actually contained a mixture of testosterone propionate, cypionate, and decanoate.]

**- INTELLIGENCE ALERT -**

**ECSTASY MIMIC TABLETS (ACTUALLY CONTAINING A PIPERAZINE MIXTURE AND CAFFEINE) IN PASADENA, TEXAS**

The Pasadena Texas Regional Crime Laboratory recently received 1,002 round yellow tablets with a raised logo of a star with rounded-off points, suspected Ecstasy (see Photo 4). The exhibits were seized in Pasadena (east-southeast of Houston) by the Pasadena Police (details sensitive). The tablets (total net mass 305.0 grams) were 8.1 millimeters in diameter, 5.6 millimeters thick, and were unusually solid in their construction. Analysis by ferricyanide (slow blue) and GC/MS, however, indicated not MDMA but rather a mixture of 1-benzylpiperazine (BZP), 1-[3-(trifluoromethyl)phenyl]piperazine (TFMPP), 1,4-dibenzylpiperazine, and caffeine (not quantitated but in an approximate 2 : 3.5 : 1 : 20 ratio). The piperazines were not confirmed due to lack of analytical standards. This was the first substantial submission of piperazines, and also the first submission of this logo design, to the laboratory.



**Photo 4 (Scale Tick-Marks are 1/8ths Inch Each)**

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**- INTELLIGENCE ALERT -**

**LSD BLOTTER ACID MIMICS (ACTUALLY CONTAINING 4-iodo-2,5-dimethoxyamphetamine (DOI) AND 4-chloro-2,5-dimethoxyamphetamine (DOC)) IN LANTANA, FLORIDA**

The Palm Beach County Sheriff's Office Crime Laboratory Chemistry Section (West Palm Beach, Florida) recently received two different exhibits of blotter paper, suspected LSD (no photos). The exhibits were seized in Lantana (about 5 miles south of Palm Beach) by the Lantana Police (no further details). The first exhibit consisted of one quarter inch square of blotter paper, orange on one side and blank on the other; analysis by Erlichs (negative), GC, and GC/MS indicated not LSD but rather 4-iodo-2,5-dimethoxyamphetamine (DOI). The second exhibit consisted of a rectangular piece of blotter paper, blank on both sides and perforated into three quarter inch squares; analysis (same techniques) indicated not LSD but rather 4-chloro-2,5-dimethoxyamphetamine (DOC). The exhibits were not formally quantitated, but both had a high loading based on their GC chromatograms. This was the first ever submission of DOI in any form, and the third submission of DOC on blotter paper, to the laboratory.

[Editor's Notes: As previously noted, submissions of "blotter acid" actually containing LSD are currently uncommon in the U.S. Most such submissions actually contain either a hallucinogenic tryptamine or phenethylamine. More recently, the hallucinogenic phenethylamines (one of the "2C" or the "DO" compounds) are becoming predominant.]



**- INTELLIGENCE ALERT -**

**HEROIN DISKS SMUGGLED AS “MOON PIES” IN NEW YORK, NEW YORK**



**Photo 5**

The DEA Northeast Laboratory (New York, New York) recently received 24 individually packaged, chocolate “moon pies,” four of which appeared to be genuine, and 20 of which instead contained a chocolate covered, wrapped disk of compressed tan powder, suspected heroin (see Photo 5). The exhibits were seized by DEA Strike Force personnel in New York (origin and seizure details sensitive). The disks (3.0 x 0.25 inches) were successively wrapped in black tape, carbon paper, aluminum foil, and green plastic, then coated with chocolate. Analysis of the compressed powder (total net mass 695.0 grams) by FTIR-ATR, GC/MS, GC/FID, and FT-NMR confirmed 67.8 percent heroin hydrochloride, adulterated with thiamine (salt form undetermined, not quantitated). This was the first such submission to the Northeast Laboratory.

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**- INTELLIGENCE ALERT -**

**COCAINE MIMIC BRICKS (ACTUALLY CONTAINING NICOTINAMIDE) IN DALLAS, TEXAS**

The DEA South Central Laboratory (Dallas, Texas) recently received four bricks of compressed off-white powder, suspected cocaine (see Photo 6). The exhibits were seized in Dallas, Texas by agents from the DEA Dallas Field Office (no further details). Each brick was wrapped in clear, black, and green plastic; one brick was marked with a coconut tree logo. Analysis of the powder (total net mass 3.78 kilograms) by GC/FID, FTIR-ATR, and GC/MS, however, indicated not cocaine but rather nicotinamide (not quantitated but high purity based on the IR), cut with a small amount of boric acid and trace dimethylsulfone. The South Central Laboratory has received several submissions of similar nicotinamide bricks over the past few months.



**Photo 6 (Actual Color is Off-White)**

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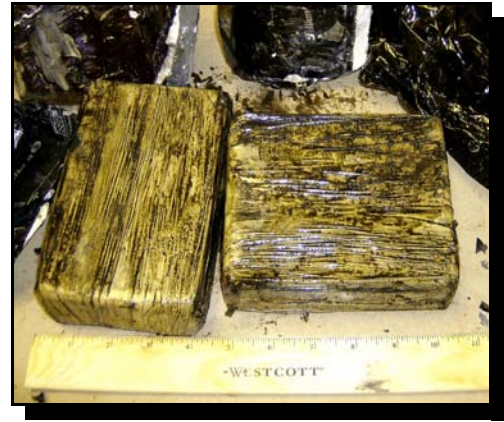
**- INTELLIGENCE ALERT -**

**COCAINE SMUGGLED IN COMPOSITE BLOCKS IN MEMPHIS, TENNESSEE**

The DEA Southeast Laboratory (Miami, Florida) recently received three separate exhibits containing a total of 23 metallic silver painted blocks, of which 20 contained a wrapped package of white powder, suspected cocaine (see Photo 7). All of the exhibits were seized by U.S. Customs and Border Protection personnel at an express parcel service hub in Memphis, Tennessee (origin not reported), and were submitted to the laboratory after a controlled delivery in North Carolina (location and details sensitive). The blocks were constructed from what appeared to be a mixture of concrete and fiberglass, and were broken open with a hammer and chisel. Three of the blocks were solid throughout, and contained no controlled substances. The packages recovered from the other 20 blocks were each wrapped in brown plastic tape and carbon paper (see Photo 8). Analysis of the powder (total net mass 9.87 kilograms) by color testing (Scotts), GC/FID, GC/MS, and FTIR confirmed 62.8, 60.3, and 66.2 percent cocaine hydrochloride in the three exhibits, respectively, adulterated with diltiazem and caffeine (not quantitated). This is the first such submission to the Southeast Laboratory.



**Photo 7**



**Photo 8**

[Editor's Notes: Three similar seizures were reported by the DEA North Central Laboratory in the May, 2008 issue of *Microgram Bulletin*. In those cases, most of the rocks contained cocaine, but two contained heroin. The seizure location in that case was not disclosed (sensitive).]

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**- INTELLIGENCE ALERT -**

**METHAMPHETAMINE PHOSPHATE IN LOS ANGELES, CALIFORNIA**

The DEA Southwest Laboratory (Vista, California) recently received a clear zip-lock bag containing five smaller bags of white, crystalline powder and one small bag of yellowish powder, all suspected methamphetamine (no photo). The exhibit was seized by DEA agents pursuant to a consent search of a residence in Los Angeles, California. Separate analyses of the white powders (total net mass 485.8 grams) by GC, GC/MS, LC, and IR confirmed d-methamphetamine hydrochloride/dimethylsulfone mixtures, ranging from trace to 99 percent



methamphetamine. Analysis of the yellowish powder (total net mass 3.0 grams; same techniques), however, indicated 81.5 percent d,l-methamphetamine phosphate, also cut with dimethylsulfone. Methamphetamine phosphate is not commonly seen at the Southwest Laboratory.

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### **- INTELLIGENCE ALERT -**

#### **ECSTASY MIMIC TABLETS (CONTAINING BZP, KETAMINE, TFMPP, DIBENZYLPIPERAZINE, AND CAFFEINE) IN MASSACHUSETTS**

The DEA Northeast Laboratory (New York, New York) recently received 12 round, mottled blue tablets with a “Michael Jordan” logo, suspected Ecstasy (see Photo 9). The exhibits were acquired by personnel from the DEA New England Field Division at a locale in Massachusetts (exact location and details sensitive). Analysis of the tablets (total net mass 3.2 grams) by GC/MS, LCMS, GC/FID, and FTIR/ATR, however, indicated not MDMA but rather 1-benzylpiperazine (BZP; 78.7 milligrams per tablet), ketamine, 1-(3-trifluoromethyl-phenyl)piperazine (TFMPP), 1,4-dibenzylpiperazine, and caffeine (only the BZP was quantitated). This is the fifth time within the past year that the Northeast Laboratory has seen BZP. Tablets with the “Michael Jordan” logo have also been previously submitted to the laboratory, but none of the previous tablets with this logo contained BZP.



**Photo 9 (Top Scale Tick-Marks are Millimeters; Squares are 2 x 2 Millimeters Each)**

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### **SELECTED REFERENCES**

[The Selected References section is a compilation of recent publications of presumed interest to forensic chemists. Unless otherwise stated, all listed citations are published in English. Abbreviated mailing address information duplicates that provided by the abstracting service. Patents and Proceedings are reported only by their *Chemical Abstracts* citation number.]

1. Bukowski EJ, Monti JA. **FTIR-ATR spectroscopy for identification of illicit drugs seized from clandestine laboratories.** American Laboratory 2007;39(20):16-19. [Editor's Notes: A review. Contact: Shimadzu Scientific Instruments, Columbia, MD 21046.]
2. Kauppila TJ, Arvola V, Haapala M, Pol J, Aalberg L, Saarela V, Franssila S, Kotiaho T, Kostianinen R. **Direct analysis of illicit drugs by desorption atmospheric pressure photoionization.** Rapid Communications in Mass Spectrometry 2008;22(7):979-985. [Editor's Notes: A feasibility study. MDMA, amphetamine, phenazepam, and buprenorphine were

detected in tablets; LSD and Bromo-Dragonfly in blotter paper; and THC and cannabinal in cannabis. Contact: Division of Pharmaceutical Chemistry, Faculty of Pharmacy, University of Helsinki FI-00014, Finland.]

3. Li Q, Xu H-k, Song Z-h, Li Q. **Analysis of organic impurity profiling of illicit methamphetamine hydrochloride crystal by GC-MS.** Fenxi Ceshi Xuebao 2007;26(3):310-314. [Editor's Notes: Used 8 characteristic impurities to determine several synthetic routes. This article is written in Chinese. Contact: Animal Science College, Nanjing Agricultural University, Nanjing, Peop. Rep. China 210095.]
4. Weyermann C, Marquis R, Delaporte C, Esseiva P, Lock E, Aalberg L, Bozenko JS Jr., Dieckmann S, Dujourdy L, Zrcek F. **Drug intelligence based on MDMA tablets data.** Forensic Science International 2008;177(1):11-16. [Editor's Notes: The main objectives of the "Collaborative Harmonisation of Methods for Profiling of Amphetamine Type Stimulants" (CHAMP) project included the harmonisation of MDMA profiling methods and the creation of a common database for drug intelligence purposes. In the preliminary stages of this project, the participating laboratories analyzed the physical characteristics, the chemical composition, and the organic impurities of MDMA tablets, using previously harmonised methods. The aim of this work was to apply statistical treatments to the recorded data in order to evaluate their potential. The first part of this article deals with organic impurities data, while the second part focuses on the potential of the physical characteristics. The statistical methods allowed differentiation of samples from different batches, and determination of links between samples. Contact: Institut de Police Scientifique, University of Lausanne, Batiment de Chimie, Lausanne-Dorigny CH-1015, Switz.]
5. Zhang Y. **Optimization of determination method for components and impurities of illicit drugs by GC-MS.** Zhongguo Yaowu Lanyong Fangzhi Zazhi 2007;13(1):19-21. [Editor's Notes: Parameters that were studied included injector temperatures, carrier gas flow rates, initial temperatures, temperature programming rates, final temperatures, and holding periods. This article is written in Chinese. Contact: Ningbo Institute of Microcirculation and Henbane, Ningbo 315010, Peop. Rep. China.]

#### **Additional References of Possible Interest:**

1. Balogh MP. **Techniques for structure elucidation of unknowns: Finding substitute active pharmaceutical ingredients in counterfeit medicines.** LC-GC Europe 2008;21(2):84-95. [Editor's Notes: A conversational overview. Contact: LC-MS Technology Development, Waters Corp., Milford, MA (zip code not provided).]
2. Clark D, Pysik A. **The analysis of pharmaceutical substances and formulated products by vibrational spectroscopy.** Applications of Vibrational Spectroscopy in Pharmaceutical Research and Development 2007:213-238. [Editor's Notes: A review. Contact: Pfizer Global R+D, Sandwich, UK.]
3. Gheorghe A, van Nuijs A, Pecceu B, Bervoets L, Jorens PG, Blust R, Neels H, Covaci A. **Analysis of cocaine and its principal metabolites in waste and surface water using solid-phase extraction and liquid chromatography-ion trap tandem mass spectrometry.** Analytical and Bioanalytical Chemistry 2008;391(4):1309-19. [Editor's Notes: Presents a validated method using SPE and LC-MS/MS for the determination of cocaine, benzoylecgonine, and ecgonine methyl ester in waste and surface water. The method was applied to a set of

samples collected in Belgium. Contact: Toxicological Centre, University of Antwerp, Universiteitsplein 1, 2610 Antwerp, Belgium.]

4. Hidvegi E, Hideg Zs, Somogyi GP. **Different reactivities of amphetamines with N-methyl-bis(trifluoroacetamide) in heated gas chromatographic injectors.** Pharmazie 2008;63(3):233-234. [Editor's Notes: Analysis by GC/MS. Focus is toxicological. Contact: National Institute of Forensic Toxicology, Budapest, Hung.]
5. Melton L. **Courtroom chemistry.** Chemistry World 2007;4(11):58-61. [Editor's Notes: A review. Contact: London, UK (no further addressing information was provided).]
6. Meng P-J. **Analysis of gamma-hydroxybutyric acid using gas chromatography/mass spectrometry after pentafluorobenzyl derivatization.** Fenxi Huaxue 2008;36(1):61-65. [Editor's Notes: Derivatization was done with pentafluorobenzyl bromide. Focus is toxicological, but detection of GHB in beverages is also detailed. This article is written in Chinese. Contact: Chinese People's Public Security University, Beijing, Peop. Rep. China 100038.]

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## SCIENTIFIC MEETINGS

**Title:** Fall 2008 SAFS Meeting (First Posting)  
**Sponsoring Organization:** Southern Association of Forensic Scientists  
**Inclusive Dates:** September 22-26, 2008  
**Location:** Sam's Town Hotel and Casino (Shreveport, LA)  
**Contact Information:** Randall Robillard (318/227-2889 or [rrobillard-at-nlcl.org](mailto:rrobillard-at-nlcl.org))  
**Website:** [www.southernforensic.org](http://www.southernforensic.org)

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**Title:** 18th Annual CLIC Meeting (First Posting)  
**Sponsoring Organization:** Clandestine Laboratory Investigating Chemists Association  
**Inclusive Dates:** September 2-6, 2008 (Natural Products Workshop only on September 2)  
**Location:** La Mansion del Rio Hotel on the Riverwalk (San Antonio, TX)  
**Contact Information:** P. Smith ([p1947s-at-hotmail.com](mailto:p1947s-at-hotmail.com))  
**Website:** None

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# Microgram

## *Bulletin*

**Published by:**

The Drug Enforcement Administration  
Office of Forensic Sciences  
Washington, DC 20537

The U.S. Attorney General has determined that the publication of this periodical is necessary in the transaction of the public business required by the Department of Justice. Information, instructions, and disclaimers are published in the January issues.

**- JULY 2008 -**

**- INTELLIGENCE ALERT -**

**COCAINE SMUGGLED IN ENGINE PISTONS IN PORT OF SPAIN  
AND CUNUPIA, TRINIDAD AND TOBAGO**

The Trinidad and Tobago Forensic Science Centre (Port of Spain) recently received two separate submissions of engine pistons (60 in total), each containing a compressed, cream colored powder, suspected cocaine (see Photo 1). The first exhibit (24 pistons) was seized by Organised Crime Narcotics and Firearms Bureau (OCNFB) personnel at an express mail handling facility in Port of Spain, and were destined for Madrid, Spain (no further details). The second submission (36 pistons) was seized by OCNFB personnel at the suspect's residence in Cunupia (Trinidad). Both exhibits were packaged in identical red and white cardboard boxes printed "PC PISTONS ENGINE PARTS" (six pistons per box). Analysis of the powders in the first exhibit (total net mass 6.52 kilograms) by color testing (Scotts - positive), GC/FID, GC/MS, and FTIR/ATR confirmed 51.0 percent cocaine



**Photo 1**

hydrochloride and lactose (not quantitated). Analysis of the powders in the second exhibit (total net mass 10.33 kilograms; same techniques) confirmed 57.0 percent cocaine hydrochloride and lactose (not quantitated). This was the first such submission to the laboratory.

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**- INTELLIGENCE ALERT -**

**SOLUTIONS OF 4-ETHYL-2,5-DIMETHOXYPHENETHYLAMINE (2C-E)  
IN DROPPER BOTTLES IN KENTUCKY**

The Kentucky State Police Western Laboratory Branch (Madisonville) recently received two plastic dropper bottles, each containing approximately 8 milliliters of clear liquid, suspected 4-bromo-2,5-dimethoxyphenethylamine (2C-B; see Photo 2). The exhibit was acquired by the Kentucky State Police (location and details sensitive). The base solvent was not identified. Evaporation of a 1 milliliter aliquot to dryness produced white crystals. Analysis of a methanolic extract by GC/MS, GC/FID and FTIR/ATR, however, indicated not 2C-B but rather 4-ethyl-2,5-dimethoxyphenethylamine (2C-E, not formally quantitated but a moderate loading based on the TIC). This was the first submission of 2C-E to the laboratory.



**Photo 2**

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**- INTELLIGENCE ALERT -**

**“FLAVORED COCAINE” IN MODESTO, CALIFORNIA**

The DEA Western Laboratory (San Francisco, California) recently received an exhibit consisting of 13 tied, clear plastic bags containing pink, off-white, and white powders, all with a generic, sweet, fruity odor, purported strawberry, lemon, and coconut flavored cocaines (see Photo 3). The exhibit was seized by a DEA Special Agent in Modesto, California, pursuant to a long-running investigation (no further details). The exhibit was split into four sub-exhibits based on color, packaging, and initial screens. Analyses were conducted by color testing (cobalt thiocyanate), FTIR, GC/MS, and GC/IRD. Analysis of the first exhibit (four bags containing pink powder, total net mass 113.1 grams) confirmed 24.4 percent cocaine hydrochloride, diltiazem, and inositol. Analysis of the second exhibit (one bag containing off-white powder, total net mass 30.2 grams) confirmed 17.1 percent cocaine hydrochloride,



**Photo 3**



diltiazem, and inositol. Analysis of the third exhibit (seven bags of white powder, total net mass 193.0 grams) confirmed 19.8 percent cocaine hydrochloride and lactose. Analysis of the fourth exhibit (one bag of white powder, total net mass 28.5 grams) confirmed 29.3 percent cocaine hydrochloride and mannitol. The diltiazem and sugars were not quantitated. The fruity odor was not identifiable (that is, it was not a specific fruit scent), and was identical in all 13 bags regardless of the alleged flavor. To date, the various exhibits submitted in this case (including various free samples and purchases) are the first examples of “flavored cocaine” seen at the Western Laboratory.

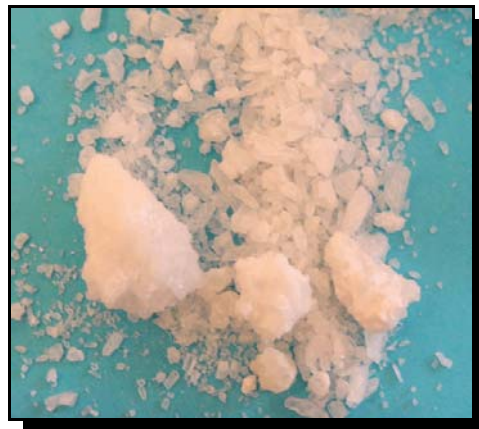
[Editor’s Notes: Although flavored “hard” drugs (notably “strawberry meth”) have received extensive press in the mass media, to date very few such exhibits have been submitted to the DEA Laboratories. This is the first report of “flavored cocaine” to *Microgram Bulletin*.]

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### **- INTELLIGENCE ALERT -**

#### **MDMA POWDER (ADULTERATED WITH MONOSODIUM GLUTAMATE) AT JFK AIRPORT, NEW YORK**

The DEA North Central Laboratory (Chicago, Illinois) recently received three exhibits consisting of two plastic bags of off-white, crystalline powders and one plastic bag of finely-ground, light green powder, all suspected MDMA (see Photos 4 and 5). The first two exhibits (origin not reported) were seized by Customs and Border Patrol personnel at the JFK International Mail Facility (Jamaica, New York), while the third was seized at a residence in Cleveland, Ohio (the relationship between the exhibits was not disclosed). Analysis of the first and second exhibits (total net masses 299.6 and 304.7 grams, respectively) by color testing (ferric chloride (red-orange)), FTIR, GC/FID, and GC/MS confirmed 49.1 and 62.5 percent MDMA hydrochloride, respectively, both cut with monosodium glutamate (MSG; not quantitated). Analysis of the green powder (total net mass 11.8 grams) by FTIR, GC/FID, and GC/MS, however, indicated not MDMA but rather a low percentage of mescaline (not quantitated). Microscopic examination of the green powder indicated that it was plant material, but it could not be further identified (however, the identification of mescaline suggests it was prepared from one of the peyote-type cacti). These are the first submissions of MDMA hydrochloride/MSG powders to the North Central Laboratory.



**Photo 4**



**Photo 5**

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**- INTELLIGENCE ALERT -**

**HEROIN/BENZYLPIPERAZINE MIXTURE IN WASHINGTON, DC**

The DEA Mid-Atlantic Laboratory (Largo, Maryland) recently received five clear ziplock bags of white powder, also containing small brown particles, suspected heroin (no photo). The exhibits (typical of street-level heroin samples) were seized in Washington, DC by the Metropolitan Police Department (no further details). Analysis of the powder (total net mass 0.30 grams) by GC/FID, GC/MS, <sup>1</sup>H-NMR, and TLC confirmed 4.0 percent heroin (calculated as the hydrochloride), adulterated with N-benzylpiperazine (BZP), caffeine, procaine, and quinine. The BZP was not formally quantitated, but was approximately 1 percent. This is the first submission of a heroin/BZP mixture to the Mid-Atlantic Laboratory.

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**- INTELLIGENCE ALERT -**

***d,l*-METHAMPHETAMINE SULFATE IN BISHKEK, KYRGYZSTAN**

The DEA Special Testing and Research Laboratory (Dulles, Virginia) recently received a folded piece of paper containing a white powder, suspected methamphetamine (see Photo 6). The exhibit was taken from a 45 gram seizure made in Bishkek, Kyrgyzstan, by personnel from the Kyrgyz Drug Control Agency (no further details). Analysis of the powder (total net mass 1.3 grams) by anion precipitation testing (silver nitrate, barium chloride), GC/MS, CE, FTIR/ATR, and NMR indicated, unusually, 44.7 percent *d,l*-methamphetamine sulfate and 46.0 percent lactose. The Special Testing and Research Laboratory rarely receives submissions of methamphetamine sulfate.



**Photo 6**

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**SELECTED REFERENCES**

[The Selected References section is a compilation of recent publications of presumed interest to forensic chemists. Unless otherwise stated, all listed citations are published in English. Abbreviated mailing address information duplicates that provided by the abstracting service. Patents and Proceedings are reported only by their *Chemical Abstracts* citation number.]

1. Babichenko S, Ivkina T, Poryvkina L, Sominsky V. **Method for on-site drug detection in illicit drug samples.** (Patent) Chemical Abstracts 2008;148:420837e.
2. Cioroch K, Zuba D. **Analytical approaches used for profiling of Ecstasy tablets.** Z Zagadnien Nauk Sadowych 2007;69:71-89. [Editor's Notes: A review of the analytical approaches used for profiling of ecstasy tablets. Contact: Instytut Ekspertyz Sadowych im. Prof. Dra Jana Sehna (no further addressing information was provided).]

3. Cotner J, Cole B, Healy J. **Quantitative comparison of common decontamination methods.** Journal of the Clandestine Laboratory Investigating Chemists Association 2008;18(1):6-10. [Editor's Notes: Presents the results of the title study (of personnel involved in clandestine laboratory raids). *JCLICA* is a law enforcement restricted publication. Contact: DEA Clandestine Laboratory Training Unit, DEA Office of Training, PO Box 1475, Quantico, VA 22134.]
  
4. Cox M. **Hydriodic acid mediated reduction of bromhexine.** Journal of the Clandestine Laboratory Investigating Chemists Association 2008;18(1):12-7. [Editor's Notes: Presents the title study (bromhexine is the co-ingredient in a pseudoephedrine-containing decongestant Bisolvon (not marketed in the U.S.)). *JCLICA* is a law enforcement restricted publication. Contact: Forensic Science SA, 21 Divett Place, Adelaide 5000, South Australia, Australia.]
  
5. Coxon A. **The cost of "P-Lab" callouts.** Journal of the Clandestine Laboratory Investigating Chemists Association 2008;18(1):10-1. [Editor's Notes: An overview of the various costs associated with the cleanup of a clandestine methamphetamine laboratory near Wellsford, New Zealand (that had exploded during operation). *JCLICA* is a law enforcement restricted publication. Contact: Institute of Environmental Science and Research Limited, Private Bag 92 021, Auckland, New Zealand.]
  
6. Coxon A, McLeay N, Ranaweera N. **Development of scene examination software for clandestine drug laboratory scenes.** Journal of the Clandestine Laboratory Investigating Chemists Association 2008;18(1):23-7. [Editor's Notes: The system is designed for use on-site, and can record both scene and exhibit information. Various macros automatically generate the wide variety of forms needed to process the site, thereby minimizing transcription errors. *JCLICA* is a law enforcement restricted publication. Contact: Institute of Environmental Science and Research Limited, Private Bag 92 021, Auckland, New Zealand.]
  
7. Davis SF, Culshaw PN, Wermuth UD. **The production of phenyl-2-propanone from benzaldehyde via a Baeyer-Villiger reaction.** Journal of the Clandestine Laboratory Investigating Chemists Association 2008;18(1):28-31. [Editor's Notes: Presents the title study (details not provided, in accordance with *Microgram* policy). *JCLICA* is a law enforcement restricted publication. Contact: Forensic Chemistry, Queensland and Health Scientific Services, 39 Kessels Rd., Coopers Plains, QLD 4108, Australia.]
  
8. Dujourdy L, Dufey V, Besacier F, Miano N, Marquis R, Lock E, Aalberg L, Dieckmann S, Zrcek F, Bozenko Jr. JS. **Drug intelligence based on organic impurities in illicit MA samples.** Forensic Science International 2008;177(2-3):153-161. [Editor's Notes: One of the main objectives of the "Collaborative Harmonisation of Methods for Profiling of Amphetamine Type Stimulants" (CHAMP) project included the harmonisation of GC/MS analyses for organic impurities found in illicit methamphetamine (MA) samples. Statistical analysis provided a selection of pertinent variables among 43 organic impurities identified in the chromatograms. Correlation coefficients were used as a discrimination tool between populations of linked samples (from the same seizure) and unlinked samples (from different seizures). The profiling method proved to be useful for the characterization of samples from different seizures, and for determination of synthetic routes. Contact: Laboratoire Police Scientifique de Lyon, 31 Avenue Franklin Roosevelt, 69134 Ecully, France.]
  
9. Dussya FE, Berchtold C, Briellmann TA, Lang C, Steiger R, Bovens M. **Validation of an ion mobility spectrometry (IMS) method for the detection of heroin and cocaine on incriminated material.** Forensic Science International 2008;177(2-3):105-111. [Editor's

Notes: The title study is presented. The limits of detection were 250 ng cocaine and 1000 ng heroin. Contact: Institute of Legal Medicine, Pestalozzistrasse 22, CH-4056 Basel, Switzerland.]

10. Janowska E, Adamowicz P, Chudzikiewicz E, Lechowicz W. **Clonazepam - A drug use for medical and criminal purposes.** *Z Zagadnien Nauk Sadowych* 2007;71:297-302. [Editor's Notes: An overview of the abuse of clonazepam in Poland. Contact: Institute of Forensic Research, Krakow, Pol. (no street address was provided).]
11. Kamb V. **Analytical profile of Lisdexamfetamine dimesylate (Vyvanse™).** *Journal of the Clandestine Laboratory Investigating Chemists Association* 2008;18(2):3-6. [Editor's Notes: Presents the title study (Lisdexamfetamine dimesylate is a new, slow release pro-drug for amphetamine, intended for treatment of ADHD). *JCLICA* is a law enforcement restricted publication. Contact: Johnson County Crime Lab, Mission, KS 66202.]
12. Locicero S, Esseiva P, Hayoz P, Dujourdy L, Besacier F, Margot P. **Cocaine profiling for strategic intelligence, a cross-border project between France and Switzerland: Part II. Validation of the statistical methodology for the profiling of cocaine.** *Forensic Science International* 2008;177(2-3):199-206. [Editor's Notes: Harmonization and optimization of analytical and statistical methodologies were carried out in order to provide drug intelligence for cocaine seizures. Part I dealt with the optimization of the analytical method and its robustness. Part II investigated statistical methodologies that provide reliable comparison of cocaine seizures analyzed on two different GC/FIDs in two different laboratories. The results indicate that centralization of the analyses in a single laboratory is not a required condition to compare samples seized in different countries. This allows collaboration, but also jurisdictional control over data. Contact: Institut de Police Scientifique, Ecole des Sciences Criminelles, Université de Lausanne, BCH, 1015 Lausanne-Dorigny, Switzerland.]
13. Martinez FS, Roesch DM, Jacobs JL. **Isolation of methamphetamine from 1-(1',4'-cyclohexadienyl)-2-methylaminopropane (CMP) using potassium permanganate.** *Journal of the Clandestine Laboratory Investigating Chemists Association* 2008;18(1):18-22. [Editor's Notes: Preliminary treatment/cleanup of methamphetamine contaminated with CMP with potassium permanganate gives "clean" methamphetamine for FTIR analysis. *JCLICA* is a law enforcement restricted publication. Contact: Drug Enforcement Administration, Southwest Laboratory, 2815 Scott St., Vista, CA 92081.]
14. Person EC, Heegel RA, Knops LA, Northrop DM. **Phosphorus-containing reducing agents: A review of their chemistry and use in the manufacture of methamphetamine and the significance of observed phosphate, phosphite, and hypophosphite in clandestine laboratory casework.** *Journal of the Clandestine Laboratory Investigating Chemists Association* 2008;18(2):7-44. [Editor's Notes: Presents the title study (details not provided, in accordance with *Microgram* policy). *JCLICA* is a law enforcement restricted publication. Contact: Department of Chemistry, California State University - Fresno, 2555 East San Ramon Avenue, SB 70, Fresno, CA 93740.]
15. Savopolos JA, Person EC. **Date rape drugs and children's toys.** *Journal of the Clandestine Laboratory Investigating Chemists Association* 2008;18(1):4-6. [Editor's Notes: Discussed the recall of a children's product that was determined to contain 1,4-butanediol instead of the listed (and intended) ingredient 1,5-pentanediol. *JCLICA* is a law enforcement restricted publication. Contact: California DOJ BFS Fresno Regional Laboratory, 5311 N. Woodrow, Fresno, CA 93740.]

16. Stanaszek R, Zuba D. **A comparison of developed and validated chromatographic methods (HPLC, GC-MS) for determination of delta-9-tetrahydrocannabinol ( $\Delta^9$ -THC) and delta-9-tetrahydrocannabinolic acid ( $\Delta^9$ -THCA-A) in hemp.** *Z Zagadnien Nauk Sadowych* 2007;71:313-22. [Editor's Notes: The correlation between the two techniques was good ( $r = 0.99$ ). Contact: Institute of Forensic Research, Krakow, Pol. (no street address was provided).]
17. Xing H, Ma G, Zhang C, Bai Y. **Application of chemometrics in heroin source determination.** *Jisuanji Yu Yingyong Huaxue* 2008;25(4):437-40. [Editor's Notes: A review and overview. This article is written in Chinese. Contact: Institute of Forensic Science, Beijing 100038, Peop. Rep. China.]
18. Zaitse K, Katagi M, Kamata H, Kamata T, Shima N, Miki A, Iwamura T, Tsuchihashi H. **Discrimination and identification of the six aromatic positional isomers of trimethoxyamphetamine (TMA) by gas chromatography-mass spectrometry (GC-MS).** *Journal of Mass Spectrometry* 2008;43(4):528-34. [Editor's Notes: A GC/MS method was developed for analysis of the six aromatic positional isomers of trimethoxyamphetamine (TMA). GC separation of all six isomers was achieved using a DB-5 MS capillary column (30 m x 0.32 mm i.d.) in less than 15 min. However, the mass spectra of the nonderivatized TMAs (except 2,4,6-TMA) were insufficient for unambiguous identification. In contrast, the mass spectra of the TFA derivatives of the six TMAs exhibited fragments with significant intensity differences, which allowed the unequivocal identifications. Contact: Forensic Science Laboratory, Osaka Prefectural Police Headquarters, 1-3-18, Hommachi, Chuo-ku, Osaka 541-0053, Japan.]
19. Zuba D. **Medicines containing ephedrine and pseudoephedrine as a source of methcathinone.** *Z Zagadnien Nauk Sadowych* 2007;71:323-33. [Editor's Notes: A review and feasibility study. Contact: Instytut Ekspertyz Sadowych im. Prof. Dra Jana Sehna (no further addressing information was provided).]

#### **Additional References of Possible Interest:**

1. Bowen A. **Putting chemistry in context: The role of the light microscope in non-routine analysis.** *Microscope* 2007;55(4):147-61. [Editor's Notes: An overview. Contact: Stoney Forensic, Inc., Chicago, IL 60616 (no street address was provided).]
2. Cowan DA. **Drug testing.** *Essays in Biochemistry* 2008;44:139-48. [Editor's Notes: An overview; focus is on antidoping. Contact: Drug Control Centre, Department of Forensic Science and Drug Monitoring, Pharmaceutical Science Division, King's College London, 150 Stamford Street, London SE1 9NH, U.K.]
3. Hadeif Y, Kaloustian J, Portugal H, Nicolay A. **Multivariate optimization of a derivatisation procedure for the simultaneous determination of nine anabolic steroids by gas chromatography coupled with mass spectrometry.** *Journal of Chromatography A* 2008;1190(1-2):278-85. [Editor's Notes: The title steroids were androsterone, nandrolone, estradiol, testosterone propionate, nandrolone-17-propionate, dydrogesterone, testosterone, epitestosterone, and boldenone. The derivatization reagent was a mixture of MSTFA, ammonium iodide, and 2-mercaptoethanol. The application was not stated in the abstract, but appears to be toxicological or anti-doping. Contact: Laboratoire de Chimie Analytique, Departement de Pharmacie, Faculte de Medecine, Universite Badji Mokhtar, B.P. 205, Annaba 23000, Algeria.]

4. Hakki EE; Kayis SA, Pinarkara E, Sag A. **Inter simple sequence repeats separate efficiently hemp from marijuana (*Cannabis sativa* L.)** Electronic Journal of Biotechnology 2007;10(4):None. [Editor's Notes: Psychoactive type Cannabis samples from 23 different locations in Turkey, hemp type Cannabis from 9 different known and 1 unknown "accessions" were analyzed. Inter Simple Sequence Repeats were employed for analysis of single plant material (SET-1) and bulked samples of same (SET-2). Data was analysed via cluster analysis and principal coordinate analysis (PCoA). PCoA analyses on the two sets were able to discriminate the psychoactive from the fiber type plants. However, discrimination of the plants was not clear via unweighted pair-group method using arithmetic average (UPGMA) dendrogram in SET-1, while they were clearly separated in SET-2. Hemp type accessions showed high levels of variation compared to drug type Cannabis, both in SET-1 and SET-2. Contact: Department of Field Crops, Faculty of Agriculture, Selcuk University, 42079, Konya-Turkey.]
  
5. Huck CW, Huck-Pezzei V, Bakry R, Bachmann S, Najam-ul-Haq M, Rainer M, Bonn GK. **Capillary electrophoresis coupled to mass spectrometry for forensic analysis.** Open Chemical Engineering Journal 2007;1(1):30-43. [Editor's Notes: A review. "Compounds with amine containing side chains, compounds with N-containing saturated ring structures, other heterocycles and peptides" are listed (but not identified) in the abstract. The focus is unclear. Contact: Institute of Analytical Chemistry and Radiochemistry, Leopold-Franzens University, Innrain 52a, 6020 Innsbruck, Austria.]
  
6. Zaitso K, Katagi M, Kamata T, Kamata H, Shima N, Tsuchihashi H, Hayashi T, Kuroki H, Matoba R. **Determination of a newly encountered designer drug "p-methoxyethyl-amphetamine" and its metabolites in human urine and blood.** Forensic Science International 2008;177(1):77-84. [Editor's Notes: Analyses were conducted by GC/MS. The study included isomeric discrimination of PMEA and its positional isomers following trifluoroacetylation. The focus is toxicological. Contact: Forensic Science Laboratory, Osaka Prefectural Police Headquarters, Japan.]

\* \* \* \* \*

## SCIENTIFIC MEETINGS

**Title:** Fall 2008 SAFS Meeting (Second Posting)  
**Sponsoring Organization:** Southern Association of Forensic Scientists  
**Inclusive Dates:** September 22-26, 2008  
**Location:** Sam's Town Hotel and Casino (Shreveport, LA)  
**Contact Information:** Randall Robillard (318/227-2889 or [rrobillard-nlcl.org](mailto:rrobillard-nlcl.org))  
**Website:** [www.southernforensic.org](http://www.southernforensic.org)

\* \* \* \* \*

**Title:** 18th Annual CLIC Meeting (Second Posting)  
**Sponsoring Organization:** Clandestine Laboratory Investigating Chemists Association  
**Inclusive Dates:** September 2-6, 2008 (Natural Products Workshop only on September 2)  
**Location:** La Mansion del Rio Hotel on the Riverwalk (San Antonio, TX)  
**Contact Information:** P. Smith ([p1947s-at-hotmail.com](mailto:p1947s-at-hotmail.com))  
**Website:** None

\* \* \* \* \*

(Meetings Continued on Next Page)

**Title:** 30th Annual SWAFS Meeting (Third Bimonthly Posting)  
**Sponsoring Organization:** Southwestern Association of Forensic Scientists  
**Inclusive Dates:** September 22-26, 2008  
**Location:** The Peabody (Little Rock, Arkansas)  
**Contact Information:** Nick Dawson (501/683-6189 or [nick.dawson-at-crimelab.arkansas.gov](mailto:nick.dawson-at-crimelab.arkansas.gov))  
**Website:** [www.swafs.us](http://www.swafs.us)

\* \* \* \* \*

## THE JOURNAL/TEXTBOOK COLLECTION EXCHANGE

The Journal/Textbook Collection Exchange is a service intended to facilitate the transfer of unwanted journals and textbooks to forensic libraries or other *Microgram* subscribers. At present, this service is offered once a quarter (in January, April, July, and October). The current donations are listed below. The offers are First Come/First Serve (except **libraries have preference**). There are no charges to the requestor. Please provide a full mailing address in the request. **Important!:** Do not provide an address that irradiates mail!

*Federal Code and Rules* - 2007 Edition

*Journal of Forensic Sciences:*

1992 - All

1993 - January (#1, 2 Copies), March (#2), July (#4), September (#5), and November (#6)

1994 - March (#2), May (#3), and July (#4)

2005 - May (#3) and July (#4)

**All subscribers are encouraged to donate surplus or unwanted items/collections.** Reference texts and long runs of forensic/analytical journals are of particular interest; however, even single issues are worthwhile, and may fill a hole in an existing collection. If interested, please consult the *Microgram* website or contact the *Microgram* Editor for further instructions.

The next offering of journals and textbooks will be in the October 2008 issue of *Microgram Bulletin*.

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## THE DEA FY 2008 STATE AND LOCAL FORENSIC CHEMISTS SEMINAR SCHEDULE

The remaining FY 2008 schedule for the State and Local Forensic Chemists Seminar is as follows:

September 8 - 12

The school is open only to forensic chemists working for law enforcement agencies, and is intended for chemists who have completed their agency's internal training program and have also been working on the bench for at least one year. There is no tuition charge. The course is held at the Hyatt Place Dulles North Hotel in Sterling, Virginia (near the Washington/Dulles International Airport). A copy of the application form is reproduced on the last page of the August 2004 issue of *Microgram Bulletin*. (See: <http://www.dea.gov/programs/forensicsci/microgram/mg0804/aug04.pdf>) Completed applications should be mailed to the Special Testing and Research Laboratory (Attention: J. Head) at: 22624 Dulles Summit Court, Dulles, VA 20166. For additional information, call 703/668-3349.



# Microgram

## *Bulletin*

**Published by:**

The Drug Enforcement Administration  
Office of Forensic Sciences  
Washington, DC 20537

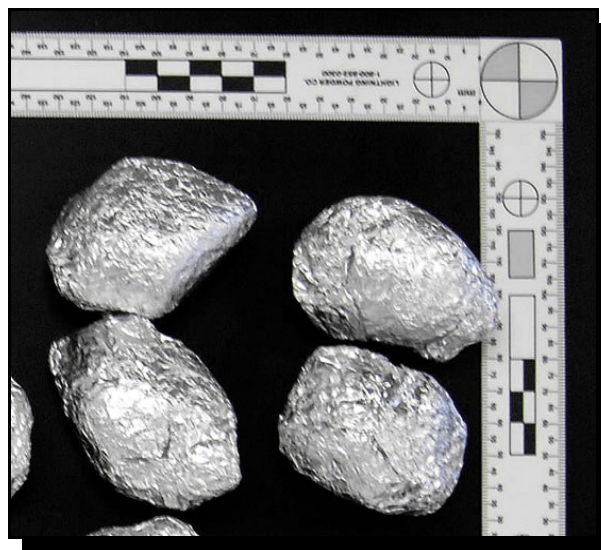
The U.S. Attorney General has determined that the publication of this periodical is necessary in the transaction of the public business required by the Department of Justice. Information, instructions, and disclaimers are published in the January issues.

- AUGUST 2008 -

**- INTELLIGENCE ALERT -**

### **HEROIN PACKAGED IN FOIL BALLS IN CLEVELAND, OHIO**

The Ohio Attorney General Bureau of Criminal Identification and Investigation Richfield Laboratory recently received 30 foil-wrapped plastic bags containing a reddish-brown powder, suspected heroin (see Photo 1). The exhibits were seized by the Ohio High Intensity Drug Task Force from an individual and subsequently at a residence in Cleveland (no further details). Analysis of the powder (total net mass 1,494 grams) by color testing (Marquis), microcrystal testing (mercuric iodide), and GC/MS confirmed heroin (not formally quantitated, but a high loading based on the TIC). No adulterants or diluents were identified; however, it was noted that the heroin would become sticky when exposed to air. Although the laboratory has previously received heroin in foil packets, this was the first submission of heroin in such large balls.



**Photo 1**

**- INTELLIGENCE ALERT -**

**ECSTASY MIMIC TABLETS (ACTUALLY CONTAINING TFMPP, mCPP, CAFFEINE, AND TRACE PHENTERMINE) IN MONTGOMERY, ALABAMA**

The Montgomery Regional Laboratory of the Alabama Department of Forensic Sciences recently received two cylindrical tablets with pink exteriors and yellow interiors, suspected Ecstasy (see Photo 2). The exhibits were seized in Tallassee, Alabama (east-northeast of Montgomery) by the Tallassee Police Department (details sensitive). The tablets (total net mass 0.45 grams) were approximately 7.1 millimeters in diameter, approximately 7.5 millimeters thick, and were unusually crude in their construction. Analysis by GC/MS (and comparisons with standards), however, indicated not MDMA but rather a 2 : 1 : 3 mixture of 1-(3-trifluoromethylphenyl)piperazine (TFMPP), 1-(3-chlorophenyl)piperazine (mCPP), and caffeine, plus trace phentermine (not quantitated). This was the first such submission to the laboratory.



**Photo 2**

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**- INTELLIGENCE ALERT -**

**ECSTASY COMBINATION TABLETS (ACTUALLY CONTAINING MDMA, METHAMPHETAMINE, CAFFEINE, AND PROCAINE) ON GRAND CAYMAN (CAYMAN ISLANDS)**

The Cayman Islands Forensic Science Laboratory (Grand Cayman) recently received a polydrug submission that included marijuana, *psilocybe* mushrooms, cocaine hydrochloride, and six round green tablets mixed with tablet fragments and green powder, suspected Ecstasy (see Photo 3); additional green powder (no tablets or fragments) was present in a separate exhibit. The exhibits were seized on Grand Cayman by the Royal Cayman Islands Police Drug Task Force. The tablets were poorly made, crumbled easily, had no discernable markings, weighed an average of 282 milligrams, and were approximately 9.1 millimeters in diameter and between 5.5 - 6.3 millimeters thick. Analysis of the tablets and powder (total net mass 4.20 grams) by color



**Photo 3**

testing (Marquis - blue / black with orange speckles), GC/MS (underivatized and with MBTFA derivatization), and FTIR/ATR confirmed MDMA along with methamphetamine, caffeine, and procaine (not quantitated but in an approximate 15 : 5 : 12 : 1 ratio based on the TIC). This is

the first submission to the laboratory of this mixture of drugs, in either tablet or powder form. Of interest, the suspect was also in possession of red phosphorus, iodine crystals, and pseudoephedrine tablets; had he succeeded in synthesizing methamphetamine, this would have been the first ever seizure of a clandestine methamphetamine laboratory in the Cayman Islands.

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**- INTELLIGENCE ALERT -**

**ECSTASY MIMIC TABLETS (ACTUALLY CONTAINING ISOPROPYL BENZYL-AMINE, COCAINE, AND CAFFEINE) IN LOS ANGELES, CALIFORNIA**

The Los Angeles (California) Police Department's Scientific Investigation Division Narcotics Analysis Unit recently received 19 tablets, of three different types, apparent Ecstasy (see Photo 4). The exhibits were seized in south Los Angeles by the Los Angeles Police Department (no further details). Ten tablets were green with a dolphin imprint, eight were blue with the same dolphin imprint, and one was blue without any imprint (but had the same texture as the blue dolphin tablets). Analysis of the green tablets by color testing (Wagners - brown, Marquis - yellow, and sodium nitroprusside -



**Photo 4**

blue, cobalt thiocyanate - color not discernable) and of a methanolic extract by GC/MS, however, indicated not MDMA but rather a mixture of isopropylbenzylamine, cocaine (confirmed), and caffeine. Similarly, analysis of the blue tablets by color testing (same tests and results, except the Marquis gave a pink color) and of a methanolic extract by GC/MS again indicated a mixture of isopropylbenzylamine, cocaine (confirmed), and caffeine. The tablets were not formally quantitated; however, the TIC indicated that there was significantly more caffeine than cocaine, and more cocaine than isopropylbenzylamine (the ratios were moderately different in the green versus the blue tablets). The laboratory has previously received Ecstasy-type tablets containing isopropylbenzylamine, and has also previously received Ecstasy-type tablets with dolphin imprints, but this was the first ever submission of Ecstasy mimic tablets containing cocaine.

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**- INTELLIGENCE ALERT -**

**ECSTASY MIMIC TABLETS (ACTUALLY CONTAINING COCAINE) IN SAN DIEGO, CALIFORNIA**

The DEA Southwest Laboratory (Vista, California) recently received two dirty tablets with identical but worn, indiscernible logos, suspected Ecstasy (see Photo 5, next page). The exhibits were seized in San Diego by FBI personnel, consequential to a search warrant for methamphetamine and cocaine base (no further details). Both tablets were white, round

(approximately 7.5 millimeters in diameter), unscored, biconvex, and had an average weight of 189.8 milligrams. Analysis by GC and GC/MS, however, indicated not MDMA but rather cocaine (salt form not determined; not quantitated but a moderate loading based on the TIC). Ecstasy-type tablets containing cocaine are rarely submitted to the Southwest Laboratory.

[Editor's Note: Unlike the tablets analyzed by the Los Angeles Police Department's Scientific Investigation Division Narcotics Analysis Unit (preceding Intelligence Alert), these tablets did not contain either isopropylbenzylamine or caffeine.]



**Photo 5**  
(Color Not True; Actual  
is Dirty White)

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#### **- INTELLIGENCE ALERT -**

### **ECSTASY MIMIC TABLETS (ACTUALLY CONTAINING 4-iodo-2,5-DIMETHOXY-PHENETHYLAMINE HYDROCHLORIDE (2C-I) IN SHERWOOD, ARKANSAS**

The DEA South Central Laboratory (Dallas, Texas) recently received 30 pink, round tablets imprinted with an "Alien" face, suspected Ecstasy (see Photo 6). The exhibits were seized in Sherwood, Arkansas by the Sherwood Police (no further details). Analysis of the tablets (total net mass 4.9 grams) by FTIR/ATR and GC/MS, however, indicated not MDMA but rather

4-iodo-2,5-dimethoxyphenethylamine hydrochloride (2C-I; not quantitated but a moderate loading based on the TIC).

Currently, 2C-I is not formally scheduled in the Controlled Substance Act, but it is considered to be an analogue of 4-bromo-2,5-dimethoxyphenethylamine (2C-B). The South Central Laboratory has received 12 submissions of 2C-I over the last four years, and has also previously received Ecstasy and Ecstasy-type tablets with the "Alien" face logo.



**Photo 6**

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#### **- INTELLIGENCE ALERT -**

### **HEROIN SMUGGLED IN A LAPTOP COMPUTER IN MIAMI, FLORIDA**

The DEA Southeast Laboratory (Miami, Florida) recently received a laptop computer containing 15 black tape-wrapped packages, each containing a light brown powder, suspected heroin (see Photos 7 - 8, next page). The computer was seized by Immigration and Customs Enforcement (ICE) personnel at Miami International Airport (no further details). Analysis of the powder



(total net mass 531.6 grams) by color testing (Marquis), GC/FID, GC/MS, and FTIR confirmed 84.7% heroin hydrochloride.



**Photo 7**



**Photo 8 - Removed Packages**

[Editor's Notes: Laptop computers (both pseudo-operational and non-operational) containing heroin have been previously submitted to the DEA Northeast, Mid-Atlantic, and Southeast Laboratories; for recent examples, see: Microgram Bulletin 2008;41(1):3 and 2008;41(3):29. Various computer components have been similarly employed; for example, see: 2008;41(2):19.]

\* \* \* \* \*

### **- INTELLIGENCE ALERT -**

#### ***d,l*-EPHEDRINE HYDROCHLORIDE DISSOLVED IN "MANGO PULP" IN THE NEW YORK AREA**

The DEA Northeast Laboratory (New York, New York) recently received six containers of "Mango Pulp," each containing an orange colored viscous, gritty, pulpy liquid, suspected to contain ephedrine (see Photo 9). The exhibits were seized by personnel from the DEA New York Strike Force (details and location sensitive). Analysis of the material (total net mass 36.8 kilograms) by GC/MS, LC/MS, GC/IRD, FTIR, and NMR, confirmed 40% *d,l*-ephedrine hydrochloride. This is the first time the Northeast Laboratory has seen this preparation.



**Photo 9**

## SELECTED REFERENCES

[The Selected References section is a compilation of recent publications of presumed interest to forensic chemists. Unless otherwise stated, all listed citations are published in English. Abbreviated mailing address information duplicates that provided by the abstracting service. Patents and Proceedings are reported only by their *Chemical Abstracts* citation number.]

1. Ali EMA, Edwards HGM, Hargreaves MD, Scowen IJ. **In-situ detection of drugs-of-abuse on clothing using confocal Raman microscopy.** *Analytica Chimica Acta* 2008;615(1):63-72. [Editor's Notes: Raman spectra were obtained from minute particles of drugs trapped between the fibers of various types of cloth (spiked with cocaine HCl or MDMA HCl). Interfering bands from the fibers could be removed by spectral subtraction. Highly fluorescent specimens were handled by exact focusing of the beam. Spectra were obtained within 3 minutes, with little or no sample preparation. Contact: Raman Spectroscopy Group, University Analytical Centre, Division of Chemical and Forensic Sciences, University of Bradford, Bradford BD7 1DP, UK.]
2. Belal T, Awad T, Deruiter J, Clark CR. **GC-MS studies on acylated derivatives of 3-methoxy-4-methyl- and 4-methoxy-3-methyl-phenethylamines: Regioisomers related to 3,4-MDMA.** *Forensic Science International* 2008;178(1):61-82. [Editor's Notes: A series of side chain regioisomers of 3-methoxy-4-methyl- and 4-methoxy-3-methyl- phenethylamines have mass spectra essentially equivalent to MDMA (mw = 193; major ions in their EI-MS at  $m/z$  58 and 135/136). However, the GC/MS spectra of the acetyl, propionyl, and trifluoroacetyl derivatives of the primary and secondary regioisomeric amines were significantly different, enabling differentiation and identification. Contact: Department of Pharmaceutical Analytical Chemistry, Faculty of Pharmacy, Alexandria University, Alexandria 21521, Egypt.]
3. Brandt SD, Martins CP, Freeman S, Dempster N, Riby PG, Gartz J, Alder JF. **Halogenated solvent interactions with N,N-dimethyltryptamine: Formation of quaternary ammonium salts and their artificially induced rearrangements during analysis.** *Forensic Science International* 2008;178(2-3):162-70. [Editor's Notes: DMT reacts with dichloromethane (methylene chloride) to give a quaternary N-chloromethyl ammonium salt, which undergoes rearrangement during GC/MS analysis to give 3-(2-chloroethyl)indole and 2-methyl-tetrahydro-*beta*-carboline. Exposure of DMT to dibromomethane and 1,2-dichloroethane gave the N-bromomethyl and N-chloroethyl quaternary ammonium derivatives, and their various rearrangement products were characterized by GC/MS and NMR spectroscopy. Contact: Institute for Health Research, School of Pharmacy and Chemistry, Liverpool John Moores University, Byrom Street, Liverpool, L3 3AF, UK.]
4. Casale JF, Boudreau DK, Jones LM. **Tropane ethyl esters in illicit cocaine: Isolation, detection, and determination of new manufacturing by-products from the clandestine purification of crude cocaine base with ethanol.** *Journal of Forensic Sciences* 2008;53(3):661-76. [Editor's Notes: Seven ethyl ester homologues of known tropane esters are formed when ethanol is used to purify crude cocaine base during illicit cocaine processing. These compounds result from the transesterification of tropane methyl esters or possibly ethyl esterification of their respective tropane C-2 carboxylic acids. The compounds were tentatively identified by GC/FID and GC/MS analyses, and confirmed by independent syntheses. Contact: Special Testing and Research Laboratory, Drug Enforcement Administration, U.S. Department of Justice, 22624 Dulles Summit Court, Dulles, VA 20166.]
5. Elliott S, Smith C. **Investigation of the first deaths in the United Kingdom involving the detection and quantitation of the piperazines BZP and 3-TFMPP.** *Journal of Analytical Toxicology* 2008;32(2):172-7. [Editor's Notes: Focus is toxicological; however, the UV and



LC/MS data for the positional isomers of 3-TFMPP and mCPP are also reported (not clear from the abstract if these isomers were synthesized or acquired from an outside source or sources).  
Contact: Sandwell and West Birmingham Hospitals NHS Trust, City Hospital, Birmingham, B18 7QH United Kingdom.]

6. Klenkar G, Liedberg B. **A microarray chip for label-free detection of narcotics.** Analytical and Bioanalytical Chemistry 2008;391(5):1679-88. [Editor's Notes: A protein array chip for label-free optical detection of low molecular weight compounds (including cocaine, ecstasy, heroin, and amphetamine) is presented. Imaging surface plasmon resonance (SPR) was used for detection. Analyses took approximately 1 minute. LODs were in the picogram/microliter level. Contact: Division of Molecular Physics, Department of Physics, Chemistry and Biology, Linköping University, 581 83, Linköping, Sweden.]
  
7. Lee JS, Chung HS, Kuwayama K, Inoue H, Lee MY, Park JH. **Determination of impurities in illicit methamphetamine seized in Korea and Japan.** Analytica Chimica Acta 2008;619(1):20-5. [Editor's Notes: GC/FID and GC/MS analyses of 436 methamphetamine samples seized in Korea displayed more than 100 compounds, among which 31 impurities and three additives were identified. 26 impurity peaks (including unknowns) were selected and used for cluster analysis, and showed that some of the samples seized in Japan might have the same origin as those seized in Korea. Contact: National Institute of Scientific Investigation, Department of Forensic Science, Seoul 158-707, Republic of Korea.]
  
8. Marquis R, Delaporte C, Esseiva P, Weyermann C, Aalberg L, Besacier F, Bozenko JS, Dahlenburg R, Kopper C, Zrcek F. **Drug intelligence based on MDMA tablets data 2. Physical characteristics profiling.** Forensic Science International 2008;178(1):34-9. [Editor's Notes: This is the latest in an ongoing series of articles detailing the progress in the "Collaborative Harmonisation of Methods for Profiling of Amphetamine Type Stimulants" (CHAMP) program. This part focuses on physical characteristics of MDMA tablets. Diameter, thickness, weight, and scoring were determined to be reliable and relevant features. The results also support the hypothesis that most of the MDMA tablets found on the international market come from the same countries. Contact: School of Criminal Sciences, BCH, University of Lausanne, Batiment Batochime, CH-1015 Lausanne-Dorigny, Switzerland.]
  
9. Wang Y, Wen Y-x, Luo A-q, Zou H. **Application of hierarchical clustering to the classification of spectra of pyrolytic cracking of heroin.** Lihua Jianyan, Huaxue Fence 2008;44(3):205-8. [Editor's Notes: Pyrolytic gas chromatographic analysis was performed on 10 different "kinds" of heroin ("kinds" not clear in the abstract - probably "samples" was intended). The results were evaluated using hierarchical clustering. This article is written in Chinese. Contact: College of Chinese People's Armed Police, Langfang 065000, Peop. Rep. China.]

#### Additional References of Possible Interest:

1. Wang Y, McCaffrey J, Norwood DL. **Recent advances in headspace gas chromatography.** Journal of Liquid Chromatography & Related Technologies 2008;31(11-12):1823-51. [Editor's Notes: A review covering the literature 2002 - 2007, including static headspace, dynamic headspace, headspace solid phase microextraction (HS-SPME), and headspace single drop microextraction (HS-SDME). Contact: Boehringer Ingelheim Pharmaceuticals, Inc., Ridgefield, USA (state and zip code not provided).]

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# Microgram

## *Bulletin*

**Published by:**

The Drug Enforcement Administration  
Office of Forensic Sciences  
Washington, DC 20537

The U.S. Attorney General has determined that the publication of this periodical is necessary in the transaction of the public business required by the Department of Justice. Information, instructions, and disclaimers are published in the January issues.

**- SEPTEMBER 2008 -**

**- INTELLIGENCE ALERT -**

### **OXYCONTIN® MIMIC TABLETS (ACTUALLY CONTAINING NITRAZEPAM, CODEINE, AND CHLORPHENIRAMINE) IN TORONTO, CANADA**

The Canada Border Services Agency (CBSA) Laboratory in Ottawa, Canada recently received five green tablets (poorly) imprinted with “80” on one face and “CDN” on the opposite face, suspected to be counterfeit Canadian OxyContin® 80 milligram tablets (see Photos 1 - 2). The exhibits were selected from 4,482 such tablets that were seized by CBSA personnel at an International Mail Centre located in Toronto (the

shipment originated in India and was hidden in a dog food package). The tablets (film-coated over a cream-colored interior) averaged 9.1 millimeters in diameter, 4.6 millimeters thick, and 381 milligrams. Analysis by FTIR and GC/MS, however, indicated not oxycodone but rather a mixture of nitrazepam, codeine, and chlorpheniramine (not formally quantitated, however, nitrazepam was the predominant ingredient based on the FTIR spectrum and the TIC). This is the first submission of OxyContin® mimic tablets to the laboratory.



**Photo 1**



**Photo 2**

**- INTELLIGENCE ALERT -**

**PSILOCYBE MUSHROOM CHOCOLATE BARS IN FLAGSTAFF, ARIZONA**

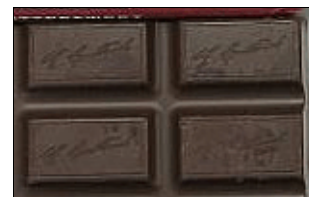
The Arizona Department of Public Safety Northern Regional Crime Laboratory (Flagstaff) recently received 174 designer-label chocolate bars that contained plant material, suspected to be either marijuana or *Psilocybe* mushrooms (see Photo 3). The exhibits (total net mass 10.7 kilograms) were seized in Flagstaff by Arizona Department of Public Safety personnel, incidental to a traffic stop where marijuana was found, and were not originally suspected to contain any controlled substance. However, upon visual inspection, the wrappings were noted to be substandard in appearance (this was confirmed upon direct comparison with the authentic product). Furthermore, upon opening, the suspect bars' wrappings were made from paper with a different texture and were glued together in a different fashion, and the bars were not wrapped in gold foil like the authentic (see Photo 4a). The suspect bars also lacked the characteristic logos



**Photo 3 (Counterfeits)**



**Photo 4a - Authentic (Left) vs. Counterfeit (Right)**



**Photo 4b - Closeup of the Authentic**



**Photo 4c - Closeup of the Counterfeit**



present on the authentic, were segmented in rectangles of noticeably different geometry, were not well manufactured or homogeneous, and contained plant material (see Photos 4b, 4c, 5, and 6). After acid/base workup and extraction with chloroform, the concentrated extract was analyzed by color testing (PDMAB - positive) and GC/MS indicated psilocin (not quantitated). Theobromine and caffeine (both expected to be present in chocolate) were also identified but not confirmed. This was the first ever submission of “psilocybin chocolates” to the laboratory.



**Photo 5 - Bottom of Authentic Product**



**Photo 6 - Bottom of Counterfeit Product**

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#### **- INTELLIGENCE BRIEF -**

### **COCAINE BRICKS IN CLEVELAND, OHIO**

The Ohio Attorney General’s Bureau of Criminal Identification and Investigation Richfield Laboratory recently received three sub-kilogram bricks of compressed white powders, two with a “USS” logo and one with a “10” logo (large “1” / small “0”), apparent cocaine (see Photos 7 and 8). The bricks were seized in Cleveland by personnel from the Cleveland HIDTA Task Force (no further details). Analysis of the powders (total net mass 2.00 kilograms) by color testing (cobalt thiocyanate), microcrystal testing (gold bromide), GC/MS, and FTIR confirmed cocaine (not formally quantitated but a high percent based on the TIC). Although cocaine bricks are routinely submitted to the laboratory, these logos were unique.



**Photo 7**



**Photo 8**

**- INTELLIGENCE BRIEF -**

**BLACK TAR HEROIN IN CARTHAGE, TENNESSEE**

The Tennessee Bureau of Investigation Laboratory in Nashville recently received three plastic bags with inner vacuum-sealed bag(s) containing a dark, hard, gum-like substance (total net mass approximately 11 kilograms), suspected black-tar heroin (see Photo 9). The exhibits were seized in Carthage by 21<sup>st</sup> District Drug Task Force personnel (no further details). The material became more gummy when exposed to air. Analysis of one exhibit (2 kilograms) by GC/MS and GC/FTIR confirmed heroin (not quantitated, but a high loading based on the TIC). This was the largest such submission ever to the laboratory.



**Photo 9**

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**- INTELLIGENCE ALERT -**

***l*-METHAMPHETAMINE HYDROCHLORIDE AND A NON-RACEMIC MIXTURE OF *d*- AND *l*- METHAMPHETAMINE HYDROCHLORIDE IN PORTLAND, OREGON**

The DEA Western Laboratory (San Francisco, California) recently received two plastic bags of crystalline material, one white (total net mass 196.4 grams) and the other off-white to white (total net mass 219.8 grams), both suspected methamphetamine (no photos). The exhibits were seized in Portland, Oregon by the Federal Bureau of Investigation (no further details). Analysis of the white crystals by FTIR/ATR and GC/FID (underivatized and following derivatization with trifluoroacetylpropyl chloride) confirmed 97.8% *l*-methamphetamine hydrochloride and dimethyl sulfone (not quantitated). Analysis of the off-white to white crystals (same techniques) confirmed 40.6% methamphetamine hydrochloride, primarily the *d*- isomer but with a small amount of the *l*- isomer, and dimethyl sulfone (not quantitated). Over the past year, the DEA Western Laboratory has seen an increasing number of exhibits containing either pure *l*-methamphetamine or non-racemic mixtures of *d*- and *l*- methamphetamine.

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**- INTELLIGENCE ALERT -**

**“ICE” METHAMPHETAMINE BRICKS CONTAINING CONCEALED BAGS OF COCAINE HYDROCHLORIDE NEAR WELLINGTON, KANSAS**

The DEA North Central Laboratory (Chicago, Illinois) recently received a two-part submission consisting of 14 red plastic wrapped, plastic containers, each containing a white crystalline powder (suspected methamphetamine), and 28 gray duct tape wrapped, plastic wrapped, topless plastic containers, each containing a similar white crystalline powder (also suspected

methamphetamine). Three of the duct taped bricks were strung together with cords attached to wooden pegs that were taped to the bricks' sides (see Photo 10; the cords were an aid to remove all 42 containers from a confined space). One of these latter bricks also contained two small plastic bags of white powder in the white, crystalline powder (no photo). The exhibits were seized by the Kansas Highway Patrol during a routine traffic stop on I-395 near Wellington (no further details). The exhibits were subdivided into 3 groups based on packaging and initial screens. Analyses were conducted using color tests, GC/MS, GC/FID, and FTIR. Analysis of the first exhibit (red containers, total net mass 8.89 kilograms) confirmed 99.7% *d*-methamphetamine hydrochloride. Analysis of the second exhibit (duct-taped bricks, total net mass 12.35 kilograms) confirmed 97.7% *d*-methamphetamine hydrochloride. Analyses of the third exhibit (2 plastic bags, total net mass 57.5 grams) confirmed 71.5% cocaine hydrochloride and phenyltetrahydroimidazothiazole (levamisole, not quantitated). It is unclear why the bags of cocaine were placed in the methamphetamine.



**Photo 10**

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### **- INTELLIGENCE ALERT -**

#### **HEROIN / ALPRAZOLAM MIXTURE IN LINTHICUM, MARYLAND**

The DEA Mid-Atlantic Laboratory (Largo, Maryland) recently received two plastic bags of brown powder, suspected heroin (see Photo 11). The exhibits were originally hidden within a hollowed-out book that was being shipped by an express mail service, and were seized in Linthicum, Maryland by Immigration and Customs Enforcement (ICE) personnel. The powder (total net mass 147.3 grams) had the consistency of slightly dried brown sugar. Analysis by GC and GC/MS confirmed 11.2% heroin, 18.7% O6-monoacetylmorphine, 9.0% morphine (all calculated as the hydrochlorides), codeine (<5%), 11.9% alprazolam, caffeine, and lidocaine. Although the Mid-Atlantic Laboratory has previously received heroin containing alprazolam, the relative percentage of alprazolam in this seizure is extremely high (commercial Xanax® tablets contain either 1 or 2 milligrams of alprazolam).



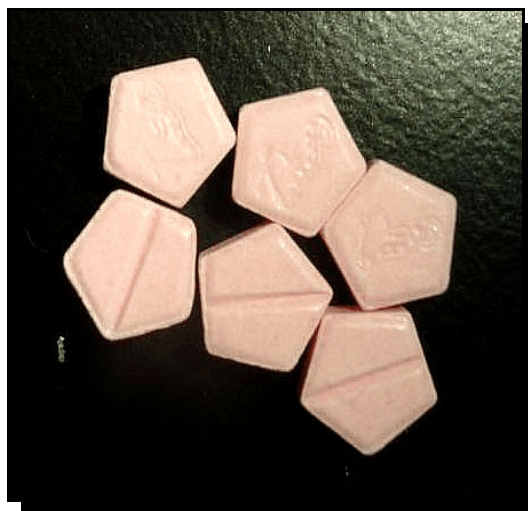
**Photo 11**



- INTELLIGENCE ALERT -

**METHANDROSTENOLONE MIMIC TABLETS (ACTUALLY CONTAINING  
17 $\alpha$ -METHYLDROMOSTANOLONE) IN ERIE, PENNSYLVANIA**

The DEA Special Testing and Research Laboratory (Dulles, Virginia) recently received two exhibits, each containing 10 pink pentagonal tablets, suspected to be methandrostenolone mimic tablets containing a different steroid (see Photo 12). The exhibits were seized in Erie, Pennsylvania (details not provided), and were submitted to the laboratory by the Pennsylvania State Police Laboratory. Analysis by GC/MS and NMR gave no library matches; however, structural elucidation software suggested 17 $\alpha$ -methyldromostanolone (a non-controlled “designer” steroid). Comparison with a standard confirmed this identification. This was the first submission of 17 $\alpha$ -methyldromostanolone in any form to the Special Testing and Research Laboratory.



**Photo 12**

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**SELECTED REFERENCES**

[The Selected References section is a compilation of recent publications of presumed interest to forensic chemists. Unless otherwise stated, all listed citations are published in English. Abbreviated mailing address information duplicates that provided by the abstracting service. Patents and Proceedings are reported only by their *Chemical Abstracts* citation number.]

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2. Casado R, Uriarte I, Cavero RY, Calvo MI. **LC-PAD determination of mescaline in cactus peyote (*Lophophora williamsii*).** Chromatographia 2008;67(7/8):665-667. [Editor's Notes: Presents the title study (“PAD” is an unusual abbreviation for photodiode array detector). Contact: Department of Pharmacy and Pharmaceutical Technology (Pharmacognosy Section), University of Navarra, Navarra, Spain 31080.]
3. Cody JT. **Amphetamines.** Handbook of Analytical Separations 2008;6(Forensic Science):127-74. [Editor's Notes: A comprehensive review. Contact: Air Force Drug Testing Laboratory, Brooks City-Base, TX 78235.]

4. Cody JT. **Hallucinogens.** Handbook of Analytical Separations 2008;6(Forensic Science):175-201. [Editor's Notes: A review; includes LSD, mescaline, psilocybin and PCP. Contact: Air Force Drug Testing Laboratory, Brooks City-Base, TX 78235.]
  
5. Holler JM, Bosy TZ, Dunkley CS, Levine B, Past MR, Jacobs A.  **$\Delta^9$ -Tetrahydrocannabinol content of commercially available hemp products.** Journal of Analytical Toxicology 2008;32(6):428-32. [Editor's Notes: 79 different hemp products were tested for THC; concentrations ranged from none detected to 117.5 mug THC/g material. The results indicate that THC levels in currently marketed hemp products are significantly lower than in those products available before 2003. Contact: Division of Forensic Toxicology, The Armed Forces Medical Examiner System, Armed Forces Institute of Pathology, Rockville, MD 20850.]
  
6. Lurie IS, Toske SG. **Applicability of ultra-performance liquid chromatography-tandem mass spectrometry for heroin profiling.** Journal of Chromatography, A 2008;1188(2):322-6. [Editor's Notes: UPLC-MS/MS allowed for the highly selective and sensitive detection of many basic and neutral impurities in heroin (including several previously unreported reticuline derivatives. LODs were as low as 10-6%. Contact: Special Testing and Research Laboratory, U.S. Drug Enforcement Administration, Dulles, VA 20166.]
  
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8. Nevescanin M, Stevic SB, Petrovic S, Vajs V. **Analysis of amphetamines illegally produced in Serbia.** Journal of the Serbian Chemical Society 2008;73(7):691-701. [Editor's Notes: 30 marker compounds were identified by GC/MS. 32 batches of amphetamine samples from three separate cases were characterized. The analyses of the tartrate, sulfate, and phosphate salts of amphetamine, as well as variously formulated tablets, are presented. The analyses showed that the amphetamines in all three cases were synthesized by the Leuckart method. Contact: Institute of Security, Belgrade 11 000, Serbia and Montenegro.]
  
9. Thevis M, Schrader Y, Thomas A, Sigmund G, Geyer H, Schaenzer W. **Analysis of confiscated black market drugs using chromatographic and mass spectrometric approaches.** Journal of Analytical Toxicology 2008;32(3):232-40. [Editor's Notes: Focus was on labelled and unlabelled formulations seized during house searches in Germany. Products included various anabolic and anabolic-androgenic steroids, anti-estrogenic agents, and virility stimulating drugs. Analytical techniques included LC-MS/MS, GC/MS with NPD, gel electrophoresis, and immunological tests. In over 25% of the cases (in particular concerning anabolic-androgenic steroids), the declared ingredients differed from the actual contents. It was also noted that counterfeit packaging was nearly indistinguishable versus authentic packaging. Contact: Center for Preventive Doping Research - Institute of Biochemistry, German Sport University Cologne, 50933 Cologne, Germany.]

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# Microgram

## *Bulletin*

**Published by:**

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The U.S. Attorney General has determined that the publication of this periodical is necessary in the transaction of the public business required by the Department of Justice. Information, instructions, and disclaimers are published in the January issues.

- OCTOBER 2008 -

**- INTELLIGENCE ALERT -**

**BRICKS OF APPARENT BLACK TAR HEROIN OR HASHISH  
(ACTUALLY CONTAINING SMALL COMPARTMENTS OF COCAINE  
HYDROCHLORIDE) IN APACHE COUNTY, ARIZONA**

The Arizona Department of Public Safety - Northern Regional Crime Laboratory (Flagstaff) recently received two bricks containing a compressed dark material, suspected either heroin or hashish. The exhibits were seized by Arizona Department of Public Safety personnel incidental to a vehicle stop in Apache County (located in northeast Arizona). Each brick (net mass approximately 800 grams each) was successively wrapped in multiple layers of plastic, then in red electrical tape. Upon disassembly, it was found that the dark material was dusted with a white powder, and furthermore that each brick had a small compartment embedded in the middle of the brick that contained a white powder (see Photo 1).

Analysis of the white powder in the two compartments (total net mass approximately 24 grams) by color testing (cobalt thiocyanate - positive) and GC/MS indicated cocaine hydrochloride (not quantitated). The dark material did not contain



**Photo 1**

any controlled substances, and was not further identified. Analysis of the white powder used to dust the bricks (mass not determined) by FTIR/ATR indicated that it was corn starch. In followup discussions with the arresting officer, it is suspected that the bricks were intended to be a rip-off. This was the first such submission to the laboratory.

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### **- INTELLIGENCE ALERT -**

#### **SQUEEZE BOTTLES OF “MASSAGE OIL” ACTUALLY CONTAINING 1,4-BUTANEDIOL IN SISKIYOU COUNTY, CALIFORNIA**

The California Department of Justice Bureau of Forensic Services Redding Laboratory recently received 14 four-ounce squeeze bottles containing varying amounts of a clear viscous liquid, submitted as an unknown/possible controlled substance (see Photo 2). The exhibits were seized by the Siskiyou County Interagency Narcotics Task Force pursuant to a traffic stop in Siskiyou County (located in far northern California). The bottles were labelled as containing “PujaL Massage Emollient,” and listed butylene glycol among the ingredients (butylene glycol is a generic term that can represent 1,2-, 1,3-, 1,4-, or 2,3- butanediol). Analysis of the liquid (total net volume approximately 1700 milliliters) by GC/MS and FTIR confirmed 1,4-butanediol (BD; not quantitated). BD (a “pro-drug” for GHB) is not currently controlled under either federal statutes or California state law. This was the first submission of this type to the laboratory.



**Photo 2 - Bottle  
and Removed Label**

\* \* \* \* \*

### **- INTELLIGENCE ALERT -**

#### **A MIXED SOLUTION OF METHAMPHETAMINE AND 1,4-BUTANEDIOL IN PHOENIX, ARIZONA**

The Arizona Department of Public Safety Central Regional Crime Laboratory (Phoenix) recently received a multi-exhibit submission that included two plastic bottles containing pink liquids (see Photo 3), suspected GHB. The exhibits were seized in the Phoenix Metropolitan area by Maricopa County Sheriff's Office personnel (no further details). Both liquids were aqueous and acidic (pH = 4). Analysis of the liquid in the larger bottle (total net volume 61 milliliters) by GC and GC/MS, however, indicated not GHB but rather a 1 : 2 mixture of methamphetamine and 1,4-butanediol (BD) (not quantitated). Analysis of the liquid in the smaller bottle (total net volume 31 milliliters) by the



**Photo 3**

same techniques identified BD only. The cause of the pink coloration was not identified. This is the first ever submission of a mixture of methamphetamine and BD to the laboratory.

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#### **- INTELLIGENCE BRIEF -**

#### **BLOTTER ACID IN WILDWOOD CITY, NEW JERSEY**

The Cape May County Prosecutor's Office Forensic Laboratory (Cape May Court House, New Jersey) recently received 20 small pieces of blank white blotter paper (total net mass 0.137 grams), each either rectangular or square in shape, wrapped in aluminum foil, suspected LSD "blotter acid" (no photos). The exhibits were seized in Wildwood City (Cape May County) by the Wildwood City Police, incidental to a noise complaint. Analysis of methanolic extracts by color testing (Ehrlich's - purple (positive)) and GC/MS confirmed LSD (not quantitated, but a moderate to high loading based on the TIC). This was the first submission of LSD (in any form) to the laboratory in at least five years.

\* \* \* \* \*

#### **- INTELLIGENCE BRIEF -**

#### **HASHISH IN PHOENIX, ARIZONA**

The Phoenix (Arizona) Police Department Laboratory Services Bureau recently received five cucumber-shaped packages containing a soft brown material with an odor of brown sugar / coffee, suspected hashish (see Photos 4 and 5). The exhibits (total gross mass 5.1 kilograms) were included in 134 packages (total gross mass approximately 1300 kilograms) that were seized by the Phoenix Police, incidental to a vehicle stop. Each of the five packages was successively wrapped in a reflective mylar, multiple layers of plastic, foil, and grease. Analysis by microscopy (cystolith hairs observed) and modified Duquenois-Levine (positive), and GC/MS of chloroform extracts confirmed THC and related cannabinoids (not quantitated, but a significant percentage of THC based on the TIC). The other 129 packages contained marijuana. This was the largest ever submission of hashish to the laboratory.



**Photo 4**



**Photo 5**



## **- INTELLIGENCE BRIEF -**

### **LARGE SEIZURE OF STEROIDS IN OKLAHOMA CITY, OKLAHOMA**

The Oklahoma State Bureau of Investigation, Forensic Science Center (Edmond) recently received a multi-exhibit submission of various tablets, capsules, liquids, and powders, all suspected steroids (see Photos 6 and 7). The exhibits were seized in Oklahoma City by personnel from the Oklahoma County Sheriff's Office and the U.S. Food and Drug Administration, pursuant to an arrest on a fugitive warrant. The suspect was reformulating bulk



**Photo 6**



**Photo 7**

steroids for sale. All items were analyzed by GC and GC/MS (quantitations were not performed). Among the items seized were:

- A) 42 vials containing liquids and one foil bag containing 250 grams of white powder, all identified as containing stanozolol.
- B) 45 dropper bottles containing liquids, identified as containing methandrostenolone.
- C) 12 multi-dose vials containing liquids, two plastic bowls each containing approximately 1 liter of yellow liquid, and two bottles containing a combined 450 milliliters of yellow liquid, all identified as containing testosterone enanthate.
- D) Seven multi-dose vials each containing approximately 10 milliliters of liquid, and one plastic bag containing 79 grams of a white powder, all identified as containing testosterone propionate.
- E) 10 multi-dose vials each containing approximately 10 milliliters of liquid, identified as containing testosterone cypionate.
- F) One plastic bag containing 20 grams of white powder, identified as containing testosterone isocaproate.
- G) One vial containing 9 milliliters of a liquid, identified as a mixture of trenbolone acetate, drostanolone propionate, testosterone enanthate, testosterone cypionate, and nandrolone decanoate.



- H) 127 clear capsules containing white powder, and one plastic bag containing 45 grams of white powder, all identified as containing oxandrolone.
- I) One plastic bag containing 5 grams of white powder, identified as drostanolone propionate.
- J) 28 vials with varying amounts of liquids, one foil bag labelled "Glukoza, 1 kg" containing a moist off-white substance, and a plastic bowl containing approximately 800 milliliters of a liquid, all identified as containing nandrolone decanoate.
- K) Three vials each containing 12 milliliters of liquid, identified as a mixture of testosterone propionate, testosterone isocaproate, and testosterone enanthate.
- L) Two vials containing 10 milliliters of a white solid/liquid, identified as a mixture of methandrostenolone, testosterone, and testosterone propionate.

In addition, one vial containing a blue liquid was identified as containing sildenafil. Five white tablets were identified as containing terbinafine. Two vials containing a yellow liquid, one vial containing a clear liquid, one plastic bottle containing approximately 260 milliliters of a liquid, and 82 white tablets were all identified as containing tamoxifen. Forty vials with labeling similar to already identified items were not tested. One manila envelope labeled "HGH #54," containing 10 multi-dose vials, each containing a white substance, were not identified. Three vials each containing a liquid, 151 white tablets, one plastic bottle containing approximately 260 milliliters of a liquid, and one plastic bottle containing approximately 800 milliliters of a yellow liquid, contained no controlled substances. This was the largest ever submission of this type to the laboratory.

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### **- INTELLIGENCE ALERT -**

#### **BLACK TAR HEROIN BRICKS IN BARSTOW, CALIFORNIA**

The DEA Southwest Laboratory (Vista, California) recently received two bricks of dark brown material, suspected heroin (see Photo 8). The exhibits were seized by a San Bernardino County Sheriff's Deputy, incidental to a traffic stop in Barstow, California. Each brick was successively wrapped in a knotted white plastic bag, multiple layers of tan tape, carbon paper, duct tape, blue grease, and a clear plastic bag. Analysis of the material (total net mass 3,622 grams) using color tests, salt tests, GC/FID, GC/MS, IR, and LC (with UV detection) confirmed 69.9% heroin hydrochloride. The uniform density and shape of the bricks was noteworthy, and suggested that the heroin was in a semi-liquid form when molded (possibly while still hot from its preparation). The Southwest Laboratory routinely receives cocaine hydrochloride bricks, and has previously received bricks of methamphetamine and (rarely) heroin; however, this is the first submission of black tar heroin bricks.



**Photo 8 (each brick was 5 x 5 x 2.5 inches)**

**- INTELLIGENCE ALERT -**

**HEROIN SMUGGLED IN A PSEUDO-OPERATIONAL FLAT-SCREEN  
TELEVISION AT MIAMI INTERNATIONAL AIRPORT**

The DEA Southeast Laboratory (Miami, Florida) recently received a 32-inch flat screen television (TV) that contained a layer of 31 small tan and off-white packages behind the screen, each containing a tan or off-white powder that field-tested positive for heroin (see Photo 9). The TV was seized by Customs and Border Patrol officers from a passenger arriving at Miami International Airport from Columbia. When plugged in and turned on, the TV would power up but gave no picture. Upon disassembly at the laboratory, it was found that a number of internal components had been removed in order to create adequate space for the packages. Analysis of the powder (total net mass 2,078 grams) by FTIR, GC/MS, GC/FID, and NMR confirmed 93.3% heroin hydrochloride. This is the first such submission to the Southeast Laboratory.



**Photo 9**

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**- INTELLIGENCE ALERT -**

**HEROIN SMUGGLED IN FAKE KIDNEY BEANS IN EL PASO, TEXAS**

The DEA South Central Laboratory (Dallas, Texas) recently received a submission of approximately 4972 fake “kidney beans” (total net mass 3,210 grams), all containing a fine tan powder, suspected heroin (see Photo 10). The “beans” were actually small plastic packets that had been painted to resemble kidney beans (see Photo 11). A few genuine beans (of a much



**Photo 10**



**Photo 11**

lighter color) were mixed in with the fakes (see the light brown beans in Photo 11, previous page). The exhibits were seized by DEA Special Agents in El Paso, Texas (no further details). Analysis of the powder by FTIR-ATR, GC/MS, and GC/FID confirmed 90.3% heroin hydrochloride. This was the first such submission to the South Central Laboratory.

[Editor's Notes: A similar submission was reported by the DEA Northeast Laboratory; see: Heroin in simulated red beans at JFK airport. Microgram Bulletin 2004;37(8):139. The beans in the above case are, however, considerably more realistic in appearance, and represent a significant increase in manufacturing sophistication.]

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### **- INTELLIGENCE ALERT -**

#### **HEROIN SMUGGLED IN PSEUDO-OPERATIONAL PERFUME SPRAY DISPENSERS IN NEW YORK CITY**

The DEA Northeast Laboratory (New York, New York) recently received four pump-spray perfume dispensers that each contained rings of compressed brown material, suspected heroin (see Photo 12). The exhibits were seized in New York City by personnel from the DEA New York Field Division (no further details). The spray pumps worked (and dispensed perfume), and there was no visual indications that the containers had been tampered with or modified. However, upon disassembly, it was found that each can contained a small, internal spray bottle filled with perfume, surrounded by several round rings of the compressed brown material (see Photo 13). Analysis of the material (total net mass 1,209 grams) by GC/MS, GC/FID, and FTIR/ATR confirmed 93.5% heroin hydrochloride. The Northeast Laboratory routinely receives heroin concealed in consumer products, but this was the first submission of this particular smuggling technique.



**Photo 12 (Containers are 7 x 2.25 Inches)**



**Photo 13**

\* \* \* \* \*

## SELECTED REFERENCES

[The Selected References section is a compilation of recent publications of presumed interest to forensic chemists. Unless otherwise stated, all listed citations are published in English. Abbreviated mailing address information duplicates that provided by the abstracting service. Patents and Proceedings are reported only by their *Chemical Abstracts* citation number.]

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2. Hargreaves MD, Page K, Munshi T, Tomsett R, Lynch G, Edwards HGM. **Analysis of seized drugs using portable Raman spectroscopy in an airport environment - A proof of principle study.** *Journal of Raman Spectroscopy* 2008;39(7):873-80. [Editor's Notes: Presents the title study, using cocaine hydrochloride and d-amphetamine sulfate as target compounds. Contact: Raman Spectroscopy Group, Division of Chemical and Forensic Sciences, School of Life Sciences, University of Bradford, Bradford BD7 1DP, UK.]
3. Hill LA, Lenehan CE, Francis PS, Adcock JL, Gange ME, Pfeffer FM, Barnett NW. **A screening test for heroin based on sequential injection analysis with dual-reagent chemiluminescence detection.** *Talanta* 2008;76(3):674-9. [Editor's Notes: Utilizes a sequential injection procedure with dual-reagent chemiluminescence detection for screening drug seizures for heroin. The chemiluminescence reagents (acidic potassium permanganate and tris(2,2'-bipyridine)ruthenium(III)) were aspirated from either side of a sample aliquot that was large enough to prevent interdispersion of the reagent zones - therefore, 2 different chemical reactions could be performed simultaneously. The presence of heroin was indicated by a strong response with the tris(2,2'-bipyridine)ruthenium(III) reagent, and was confirmed by an increase in the response with the permanganate reagent when the sample was treated with sodium hydroxide to hydrolyze the heroin to morphine. Contact: School of Life and Environmental Sciences, Deakin University, Geelong, Vic, 3217 Australia.]
4. Howard C, Gilmore S, Robertson J, Rod Peakall R. **Developmental validation of a Cannabis sativa STR multiplex system for forensic analysis.** *Journal of Forensic Sciences* 2008;53(5):1061-7. [Editor's Notes: Presents the results of a validation study based on recommendations of the Scientific Working Group on DNA Analysis Methods (SWGDM). Contact: School of Botany and Zoology, The Australian National University, Canberra ACT 0200, Australia.]
5. Inoue H, Kuwayama K, Iwata YT, Kanamori T, Tsujikawa K, Miyaguchi H. **Simple and simultaneous detection of methamphetamine and dimethyl sulfone in crystalline methamphetamine seizures by fast gas chromatography.** *Forensic Toxicology* 2008;26(1):19-22. [Editor's Notes: Diphenylmethane was used as an internal standard. Use of a narrow-bore capillary column gave fast and complete separation of the 3 compounds within 1.3 minutes. Contact: National Research Institute of Police Science 6-3-1 Kashiwanoha, Kashiwa 277-0882, Japan.]
6. Kanai K, Takekawa K, Kumamoto T, Ishikawa T, Ohmori T. **Simultaneous analysis of six phenethylamine-type designer drugs by TLC, LC-MS, and GC-MS.** *Forensic Toxicology*



- 2008;26(1):6-12. [Editor's Notes: Extensive data are presented for analyses of 2,5-dimethoxyphenethylamine (2C-H), 2,5-dimethoxyamphetamine (2,5-DMA), 4-bromo-2,5-dimethoxyphenethylamine (2C-B), 4-bromo-2,5-dimethoxyamphetamine (DOB), 4-iodo-2,5-dimethoxyphenethylamine (2C-I), and 4-iodo-2,5-dimethoxyamphetamine (DOI), including <sup>1</sup>H-NMR, IR, LC, GC, TLC (with 7 different solvent systems), EI-MS (underivatized and following trifluoroacetyl derivatization), LC/MS, and GC/MS. Contact: Forensic Science Laboratory, Yamanashi Prefectural Police HQ, Yamanashi, Japan.]
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  8. Lee JS, Park YH, Rhee JS, Jeong JI, Lim MA, Chung HS. **Planting conditions of Korean cannabis derived from stable isotope ratio and tetrahydrocannabinol contents.** Yakhak Hoechi 2008;52(3):172-5. [Editor's Notes: Stable isotope ratio of carbon and nitrogen and THC contents were measured on 37 Korean cannabis and 10 commercial grade marijuana seized in Korea. This article is written in Korean. (Note: The abstract is unclear - "cannabis" and "commercial grade marijuana" appear to actually mean wild-growing versus illicitly cultivated.) Contact: Department of Forensic Science, National Institute of Scientific Investigation, Seoul 158-707, S. Korea.]
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  11. Rudakov TN, Hayes PA, Flexman JH. **Optimized NQR pulse technique for the effective detection of heroin base.** Solid State Nuclear Magnetic Resonance 2008;33(3):31-5. [Editor's Notes: Presents the title study. Contact: Research Division, QR Sciences Limited, Cannington, WA, 6107 Australia.]
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2. Hadeif Y, Kaloustian J, Nicolay A, Portugal H. **Thermal stability evaluation of doping compounds before GC-MS analysis by DSC.** Journal of Thermal Analysis and Calorimetry 2008;93(2):553-60. [Editor's Notes: The thermal stability of 17 "doping" compounds (anabolic steroids and other related substances) were tested by DSC, for their potential GC/MS analysis either under free form or following TMS derivatization. Under optimized conditions, all 17 compounds could be analyzed in the same GC/MS run. Contact: Laboratoire de Chimie Analytique, Departement de Pharmacie, Faculte de Medecine, Universite Badji Mokhtar, Annaba, Algerie 23000, Fr.]
3. Li Y-z, Min S-g, Liu X. **Applications of near-infrared spectroscopy to analysis of traditional Chinese herbal medicine.** Guangpuxue Yu Guangpu Fenxi 2008;28(7):1549-53. [Editor's Notes: Introduces the principles and methods of NIR spectroscopy, and reviews its application for analyses of traditional Chinese herbal medicines. This article is written in Chinese. Contact: College of Science, China Agricultural University, Beijing 100094, Peop. Rep. China.]
4. O'Neil AJ, Jee RD, Lee G, Charvill A, Moffat AC. **Use of a portable near infrared spectrometer for the authentication of tablets and the detection of counterfeit versions.** Journal of Near Infrared Spectroscopy 2008;16(3):327-33. [Editor's Notes: A portable NIR transmittance spectrometer was evaluated for analyses of authentic and counterfeit Cialis and Levitra tablets. The spectra were adequate to both enable tablet authentication and to group counterfeits by origin. Contact: Centre for Pharmaceutical Analysis, The School of Pharmacy, University of London, London WC1N 1AX, UK.]
5. Ojanpera I. **Mushroom toxins.** Handbook of Analytical Separations 2008;6(Forensic Science):391-9. [Editor's Notes: A review. Contact: Department of Forensic Medicine, University of Helsinki, FI-00014 Finland.]
6. Zuo Y, Zhang K, Wu J, Rego C, Fritz J. **An accurate and nondestructive GC method for determination of cocaine on US paper currency.** Journal of Separation Science 2008;31(13):2444-50. [Editor's Notes: The method uses a fast ultrasonic extraction with water, then a SPE cleanup using a C18 cartridge, followed by capillary GC for separation, identification, and quantification. Contact: Department of Chemistry and Biochemistry, University of Massachusetts Dartmouth, North Dartmouth, MA (zip code not provided).]



## THE JOURNAL/TEXTBOOK COLLECTION EXCHANGE

The Journal/Textbook Collection Exchange is a service intended to facilitate the transfer of unwanted journals and textbooks to forensic libraries or other *Microgram* subscribers. At present, this service is offered once a quarter (in January, April, July, and October). The current donations are listed below. The offers are First Come/First Serve (except **libraries have preference**). There are no charges to the requestor. Please provide a full mailing address in the request. **Important!:** Do not provide an address that irradiates mail!

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The next offering of journals and textbooks will be in the January 2009 issue of *Microgram Bulletin*.

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## THE DEA FY 2009 STATE AND LOCAL FORENSIC CHEMISTS SEMINAR SCHEDULE

The FY 2009 schedule for the State and Local Forensic Chemists Seminar is as follows:

November 3-7, 2008

March 2-6, 2009

June 1-5, 2009

September 14-18, 2009

The school is open only to forensic chemists working for law enforcement agencies, and is intended for chemists who have completed their agency's internal training program and have also been working on the bench for at least one year. There is no tuition charge. The course is held at the Hyatt Place Dulles North Hotel in Sterling, Virginia (near the Washington/Dulles International Airport). A copy of the application form is reproduced on the last page of the August 2004 issue of *Microgram Bulletin*. (See:

<http://www.dea.gov/programs/forensicsci/microgram/mg0804/aug04.pdf>) Completed applications should be mailed to the Special Testing and Research Laboratory (Attention: J. Head) at: 22624 Dulles Summit Court, Dulles, VA 20166. For additional information, call 703/668-3349.

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# Microgram

## *Bulletin*

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Washington, DC 20537

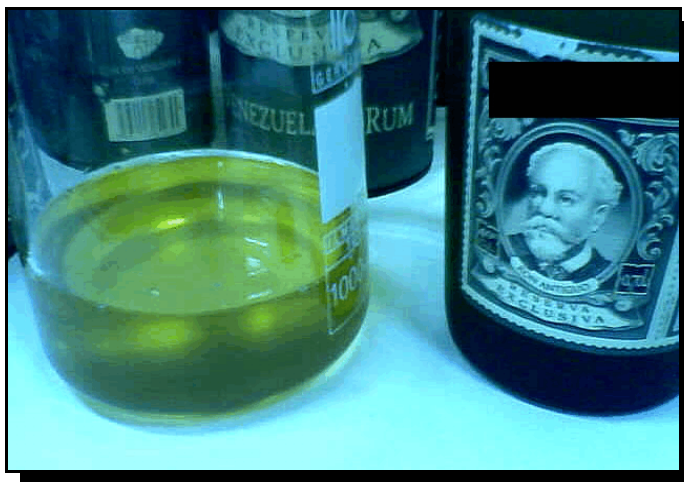
The U.S. Attorney General has determined that the publication of this periodical is necessary in the transaction of the public business required by the Department of Justice. Information, instructions, and disclaimers are published in the January issues.

- NOVEMBER 2008 -

**- INTELLIGENCE ALERT -**

### **COCAINE SOLUTIONS IN RUM BOTTLES IN SEVILLE, SPAIN**

The Stupeficient Control Laboratory of the Health Department (Seville, southwestern Spain) recently received 12 bottles of Venezuelan Rum, each containing a yellow liquid suspected to contain dissolved cocaine (see Photo 1). The exhibits were seized by the Police/Anti-Narcotics Enforcement Department from a passenger arriving at the Seville airport on a flight from Venezuela. The bottles were labelled as containing 0.7 liter of liquid, but the actual volumes ranged between 623 and 687 milliliters. Analysis by color testing, GC/FID, and GC/MS confirmed cocaine base (range 17.6 to 27.7 percent, average 22.8 percent). The total amount of cocaine base in the 12 bottles was 1986.9 grams. This was the largest such submission to the laboratory.



**Photo 1**

**- INTELLIGENCE ALERT -**

**MULTI-COLORED ECSTASY COMBINATION TABLETS (CONTAINING MDMA, METHAMPHETAMINE, AND CAFFEINE, OR MDMA, KETAMINE, AND CAFFEINE) AND ECSTASY MIMIC TABLETS (ACTUALLY CONTAINING KETAMINE, BENZYLPIPERAZINE (BZP), TRIFLUOROMETHYLPHENYL-PIPERAZINE (TFMPP), AND CAFFEINE) IN NORTHERN CALIFORNIA**

The DEA Western Laboratory (San Francisco, California) recently received five different sets of unusual, multi-colored tablets, all suspected Ecstasy (see Photo 2). The exhibits were acquired in northern California by personnel from the DEA San Francisco Field Division (exact location and details sensitive).

Preliminary screening enabled two of the five sets to be combined (Set #3 below). The first set included 15 tablets (total net mass 5.2 grams) that were layered red and yellow, with a “C” logo (see Photo 3). Analysis by GC/MS, color testing (Marquis), GC/IRD, and HPLC confirmed MDMA (5.2 milligrams per tablet), methamphetamine (less than 1%), caffeine, and dimethyl sulfone. The second set included 68 tablets (total net mass 24.5 grams) that were layered brown and red, again with the “C” logo. Analysis (same techniques) confirmed MDMA (5.7 milligrams per tablet), methamphetamine (less than 1%), caffeine, and dimethyl sulfone. The third set included 32 tablets that were layered blue and green and 38 tablets that were layered orange and blue (total net mass of all 70 tablets 25.2 grams), also with the “C” logo. Analysis (same techniques) confirmed MDMA (4.8 milligrams per tablet), ketamine (not quantitated but similar to the MDMA quant), caffeine, and dimethyl sulfone. The fourth set included 17 tablets (total net mass 4.6 grams) that were orange with blue speckles, with an “A” logo (photo not available). Analysis by GC/FID, GC/MS, and GC/IRD, however, indicated not MDMA but rather ketamine (22.3 milligrams per tablet), N-benzylpiperazine (BZP, not quantitated), 1-(3-trifluoromethyl)phenylpiperazine (TFMPP, not quantitated), caffeine, and dimethyl sulfone. The primary component in all four sets was caffeine. Ecstasy combination tablets with low MDMA quants, and Ecstasy mimic tablets with ketamine/piperazine mixtures, are both becoming more common at the Western Laboratory. This is the first known submission of tablets with “layered” appearances to the laboratory.



**Photo 2**



**Photo 3**

**- INTELLIGENCE ALERT -**

**HASH OIL IN DETROIT, MICHIGAN**

The DEA North Central Laboratory (Chicago, Illinois) recently received a brown packing tape wrapped package that contained a folded-over, heat-sealed plastic bag containing a viscous black substance, suspected heroin (see Photo 4). The exhibit was seized in Detroit by agents from the DEA Detroit Field Division (details sensitive). The material (total net mass 2,270 grams) had no particular odor. Analysis by microscopy indicated no plant or other solid material. A Duquenois – Levine test was positive, and GC/MS confirmed  $\Delta^9$ -tetrahydrocannabinol (THC), cannabinol, and cannabidiol (not quantitated, but a high loading of THC based on the TIC). This is the largest ever submission of “hash oil” to the North Central Laboratory.



**Photo 4**

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**- INTELLIGENCE BRIEF -**

**“COCA TEA CANDIES” AT BOLLING AFB, MARYLAND**

The DEA Mid-Atlantic Laboratory (Largo, Maryland) recently received four unlabelled, individually plastic-wrapped, dark green colored lozenges, each 1 x 0.5 x 0.25 inches, total net mass 17.2 grams, alleged “Coca Tea Candies” (see Photo 5). The exhibits were submitted as evidence in a military court martial at Bolling Air Force Base (just outside Washington, DC); the defendant in the case claimed that the candies were responsible for a positive drug test for cocaine. Standard screening by GC/FID, GC/MS, and FTIR did not confirm the presence of cocaine. More extensive workup of a 5 gram sample (grinding, dissolution in water, sonication,



**Photo 5**

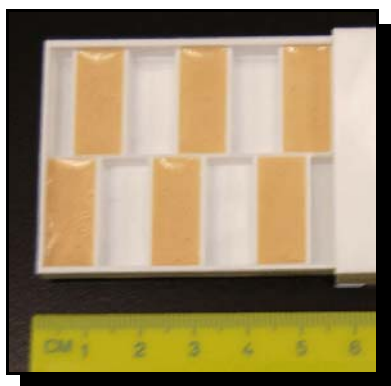
basification, extraction with chloroform, concentration, and analysis of the concentrated extract by GC/FID and GC/MS) confirmed cocaine at less than 0.01 percent. This quantity was judged to be insufficient to cause a positive drug test, and the defendant in the case was convicted. This is the first submission of “Coca Tea Candies” to the Mid-Atlantic Laboratory.



- INTELLIGENCE BRIEF -

**GELATINOUS BARS CONTAINING EITHER BUPRENORPHINE AND CAFFEINE  
OR FENTANYL IN SEMINOLE, FLORIDA**

The DEA Special Testing and Research Laboratory (Dulles, Virginia) recently received three plastic trays that contained varying numbers of different color, gummy “bars” of gelatinous materials in small wells (2 x 1 centimeters each), suspected to contain either suboxone (buprenorphine and naloxone) or fentanyl (see Photos 6 - 8). The exhibits were seized in Seminole, Florida by DEA Diversion Control personnel (details sensitive). The first tray contained six tan-colored “bars” (total net mass 5.1 grams), the second tray contained 11 light brown-colored “bars” (total net mass 11.1 grams), and the third tray contained 12 darker brown-colored “bars” (total net mass 12.6 grams). Analyses were conducted by color testing, GC/FID, GC/MS, and FT/NMR. The tan “bars” all contained buprenorphine (not quantitated) and caffeine; the light brown and darker brown “bars” all contained fentanyl (not quantitated). This is believed to be the first submission of these type exhibits to the Special Testing and Research Laboratory.



**Photo 6**



**Photo 7**



**Photo 8**

\* \* \* \* \*

**SELECTED REFERENCES**

[The Selected References section is a compilation of recent publications of presumed interest to forensic chemists. Unless otherwise stated, all listed citations are published in English. Abbreviated mailing address information duplicates that provided by the abstracting service. Patents and Proceedings are reported only by their *Chemical Abstracts* citation number.]

1. Li X, Liu B, Zhu K, Tu D. **The application of near infrared spectral characteristic peaks in counterfeit drugs analysis.** Zhongguo Yaoshi (Beijing, China) 2008;22(7):558-9. [Editor's Notes: Presents the title study. Focus is on counterfeits of “some famous brand drugs” (not specified in the abstract). This article is written in Chinese. Contact: Drug Control Institute of Chuzhou City, Chuzhou 239000, Peop. Rep. China.]
2. Nathaniel AH. **Drug detection kit and method.** (Patent) Chemical Abstracts 2008;149:240626x.

3. Yang S, Liu X, Qiao J. **Analysis of diluents in retail heroin seized in Beijing in 2005.** Zhongguo Yaowu Yilaixing Zazhi 2007;16(4):276-80. [Editor's Notes: Analyses were conducted by GC/MS. Of 408 samples, 323 (79.2%) contained diluents, including nicotinamide (231 samples, 56.6%), caffeine (135 samples, 33.1%), acetaminophen (51 samples, 12.5%), aminopyrine (39 samples, 9.6%), theophylline (37 samples, 9.1%), phenacetin (29 samples, 7.1%), piracetam (28 samples, 6.9%), sedatives and hypnotics (not specified in the abstract, 10 samples, 2.4%), or tramadol and others (10 samples, 2.4%). This article is written in Chinese. Contact: Forensic Medical Examination Center, Beijing Public Security Bureau, Beijing 100085, Peop. Rep. China.]
4. Yasuda I, Takahashi M. **Analysis of illegal drugs.** Bunseki 2008(1):26-31. [Editor's Notes: A review, discussing analyses of illegal drugs, including phenethylamines, tryptamines, piperazines, nitrite esters, etc. This article is written in Japanese. Contact: Tokyo Metropolitan Institute of Public Health, 3-24-1 Hyakunin-cho, Shinjuku-ku, Tokyo, Japan 169-0073.]

#### **Additional References of Possible Interest:**

1. Deconinck E, van Nederkassel AM, Stanimirova I, Daszykowski M, Bensaid F, Lees M, Martin GJ, Desmurs JR, Smeyers-Verbeke J, Vander Heyden Y. **Isotopic ratios to detect infringements of patents or proprietary processes of pharmaceuticals: Two case studies.** Journal of Pharmaceutical and Biomedical Analysis 2008;48(1):27-41. [Editor's Notes: Isotopic ratios were used to differentiate sample groups of acetyl salicylic acid and ibuprofen that originated from different countries and manufacturers. Contact: Vrije Universiteit Brussel (VUB), Department of Analytical Chemistry and Pharmaceutical Technology, Laarbeeklaan 103, Brussels B-1090, Belg.]
2. Lei Y, Luo Z-Y, Hu C-Q. **Rapidly screening counterfeit drugs using near infrared spectroscopy: Combining qualitative analysis with quantitative analysis to increase effectiveness.** Journal of Near Infrared Spectroscopy 2008;16(3):349-55. [Editor's Notes: Five generic vitamin tablets with different active ingredients, produced by different manufacturers, were analyzed by qualitative and quantitative NIR spectroscopy. The differences in the spectra were significant enough to discriminate the tablets, and also to detect counterfeit samples. Contact: GuangDong Institute for Drug Control, Peop. Rep. China (no further addressing information was provided).]
3. Lin C-H, Kaneta T, Chen H-M, Chen W-X, Chang H-W, Liu J-T. **Applications of Hadamard transform to gas chromatography/mass spectrometry and liquid chromatography/mass spectrometry.** Analytical Chemistry 2008;80(15):5755-9. [Editor's Notes: Successful application of the Hadamard transform (HT) technique to GC/MS and LC/MS analyses of MDMA and DMT is described. The S/N ratios of the signals were substantially improved. A practical example (toxicological) was presented. Contact: Department of Chemistry, National Taiwan Normal University, Taipei, Taiwan.]
4. Pilau EJ, Silva RGC, Jardim ICFS, Augusto F. **Molecularly imprinted sol-gel silica for solid phase extraction of phenobarbital.** Journal of the Brazilian Chemical Society 2008;19(6):1136-43. [Editor's Notes: A molecularly imprinted organically modified silica was prepared through a simple sol-gel procedure, and evaluated for solid-phase extraction of phenobarbital from aqueous and forensic samples. Focus appears to be toxicological. Contact: Instituto de Quimica, Universidade Estadual de Campinas, Campinas 13084-971, Brazil.]

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# Microgram

## *Bulletin*

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The U.S. Attorney General has determined that the publication of this periodical is necessary in the transaction of the public business required by the Department of Justice. Information, instructions, and disclaimers are published in the January issues.

- DECEMBER 2008 -

- INTELLIGENCE BRIEF -

### PEYOTE CACTI AND *PSILOCYBE* MUSHROOMS IN ROGERS, ARKANSAS

The Arkansas State Crime Laboratory in Little Rock recently received three cactus plants, presumed peyote (see Photo 1), and a small clump of mushrooms, presumed *psilocybe* mushrooms (no photo). The exhibits were seized in Rogers (far northwest Arkansas) by the Rogers Police Department, incidental to a traffic stop. The cactus plants and the clump of mushrooms still had their root systems intact, and also still had dirt attached to their roots; it appeared that the suspect was transferring the exhibits as “starters” for setting up grow operations at a new locale. Analysis of a methanolic extract of the cacti (total net mass 142.0 grams) by TLC and GC/MS confirmed mescaline (not quantitated). Analysis of a methanolic extract of the mushrooms (total net mass 5.5 grams) by TLC and GC/MS confirmed psilocin. *Psilocybe* mushrooms are routinely submitted to the laboratory; however, this was the first submission of peyote in several years.

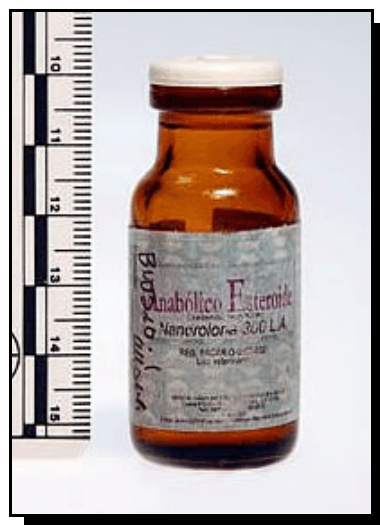


**Photo 1**

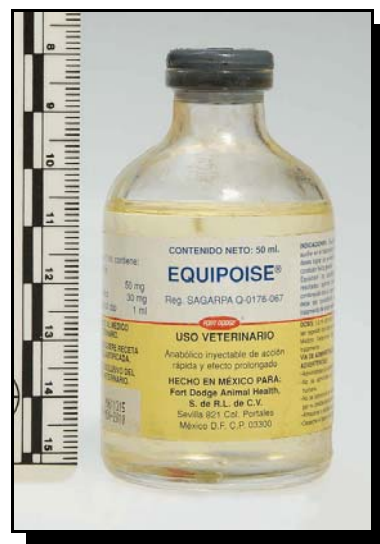
**- INTELLIGENCE ALERT -**

**BOLDENONE VIALS AND HYDROCODONE AND STANOZOLOL  
TABLETS AT THE EL PASO AIRPORT, TEXAS**

The El Paso (Texas) Police Department's Crime Laboratory recently received a polydrug submission including two different type of glass vials labelled as containing nandralone and boldenone, respectively, and three different types of tablets, two in containers labelled oxycodone and hydrocodone, respectively, and the third in an unlabelled heat-sealed plastic bag. The exhibits were seized at the El Paso airport by TSA personnel, pursuant to a screening search of a suspect and a followup search of the suspect's luggage. The first exhibit (see Photo 2) included one tampered (opened/partially used) and two factory-sealed amber 10 milliliter vials, each labelled "Anabolico Esteroides" from Ttokkyo Laboratories, and listing nandrolone decanoate 300 milligrams as their contents. The liquid in each vial was analyzed separately; analysis of methanolic extracts by GC/MS, however, indicated not nandralone but rather boldenone (not quantitated); separate analyses of hexane/acetonitrile extracts by GC/MS confirmed boldenone. The second exhibit (see Photo 3) included two factory-sealed clear 50 milliliter vials, each labelled "Equipoise" and "Made in Mexico for Fort Dodge Animal Health," and listing boldenone 50 milligrams as their contents. Standard workup and analysis by GC/MS confirmed boldenone (not quantitated). The third exhibit (no photo) included 18 white tablets, submitted in a prescription container labeled oxycodone. Pharmaceutical identification, acid/base workup, and analysis of a chloroform extract by GC/MS, however, indicated not oxycodone but rather hydrocodone (not quantitated). The fourth exhibit (no photo) included 78 white tablets, submitted in a pharmaceutical type container labeled hydrocodone. Pharmaceutical identification, acid/base workup, and analysis of a chloroform extract by GC/MS confirmed hydrocodone (not quantitated). The fifth exhibit included 100 red pentagonal tablets (4 millimeters across each edge of the pentagon), submitted in an unlabelled heat-sealed plastic bag. Each tablet was imprinted with the letter "T" on one side and the number 10 on the opposite side (see Photo 4). This tablet type and logos were not found in any pharmaceutical reference. Analysis of methanolic and separately of chloroform extracts by GC/MS indicated stanozolol (not quantitated). These are the first submissions of foreign-produced steroids to the laboratory.



**Photo 2**



**Photo 3**



**Photo 4**

**- INTELLIGENCE ALERT -**

**ECSTASY MIMIC TABLETS (ACTUALLY CONTAINING MIXTURES OF BENZYLPIPERAZINE (BZP) AND TRIFLUOROMETHYLPHENYLPIPERAZINE (TFMPP)) IN PORTLAND, OREGON**

The Portland Metro Forensic Laboratory of the Oregon State Police recently received 18 vibrantly colored tablets of five different types, all suspected Ecstasy (see Photos 5 and 6). The exhibits were seized in Portland by the Portland Police Department, incidental to a stop for a traffic violation and subsequent consent search. The tablets were mixed together; there were six round orange tablets imprinted with an Interstate 5 shield logo (total net mass 1.7 grams), four green tablets, shaped and imprinted to resemble a “Transformer”(total net mass 1.1 grams), four round purple tablets imprinted with an JL Audio logo (total net mass 1.2 grams), three pink tablets, shaped and imprinted to resemble the head of Bart Simpson (total net mass 0.8 grams), and one round blue tablet imprinted with the Superman logo (total net mass 0.2 grams). The Transformer and Bart Simpson tablets were very detailed and well-pressed, and more resembled candies or children’s chewable vitamins as opposed to typical Ecstasy tablets. Analysis by color tests (Marquis and nitroprusside), GC/MS, and UV, however, indicated not MDMA but rather a 1 :1 mixture of benzylpiperazine (BZP) and trifluoromethylphenylpiperazine (TFMPP) for the orange, green, purple and blue tablets, and a 1 : 2 mixture of BZP and TFMPP for the pink tablets. The piperazines were not formally quantitated, but were present in a moderate to high loading based on the TIC and UV. The laboratory has received numerous Ecstasy mimic tablets containing this piperazine mixture over the past year, but never before in these unusual tablet shapes. Since this initial submission, the laboratory received an exhibit containing another 30 of the green Transformer-shaped and imprinted tablets, also containing the 1 : 1 mixture of BZP and TFMPP.



**Photo 5**



**Photo 6**



**- INTELLIGENCE ALERT -**

**ECSTASY MIMIC TABLETS (ACTUALLY CONTAINING ONLY TRIFLUOROMETHYLPHENYLPIPERAZINE (TFMPP)) AND ECSTASY COMBINATION TABLETS (CONTAINING A MIXTURE OF CAFFEINE, MDMA, AND METHAMPHETAMINE) IN TULSA, OKLAHOMA**

The Tulsa (Oklahoma) Police Department Forensic Laboratory recently received 47 tablets of four different colors and logos, suspected Ecstasy (no photos). The exhibits were seized in Tulsa by the Tulsa Police Department, pursuant to a search warrant (no further details). The tablets were mixed together; there were 10 blue round tablets with a Coach logo imprint, 10 purple round tablets with a butterfly imprint, 10 pink round tablets with a New York Yankees logo imprint, and 17 light blue round tablets with a "1" imprint. Analysis of the pink, blue, and purple tablets by color testing (Marquis - positive) and GC/MS indicated a 6 : 3 : 1 mixture of caffeine, MDMA, and methamphetamine (not formally quantitated; however, a moderate concentration based on the TIC). Analysis of the light blue tablets by color testing (Marquis - negative) and GC/MS, however, detected neither MDMA or methamphetamine, but rather only trifluoromethylphenylpiperazine (TFMPP, not formally quantitated; however, a moderate concentration based on the TIC). The laboratory has previously received Ecstasy mimic tablets containing mixtures of TFMPP and benzylpiperazine (BZP), but this was the first known submission of Ecstasy mimic tablets containing only TFMPP.

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**- INTELLIGENCE ALERT -**

***SCELETIUM TORTUOSUM* IN JAMESPORT, MISSOURI**

The Missouri State Highway Patrol Crime Laboratory (Troop H - St. Joseph) recently received a plastic bag containing a finely ground, light brown-green plant material, suspected marijuana (see Photo 7). The exhibit was seized in Jamesport (northwest Missouri) by the Daviess County Sheriff's Office, pursuant to a vehicle search. Screening of the material (total net mass 7.97 grams) by microscopy and Duquenois-Levine, however, were negative. Analysis by GC/MS indicated mesembrine, mesembrenone, and mesembrenol, all mildly psychoactive compounds in *Sceletium tortuosum*. This plant, also known as Kanna, Channa, and Kougoed, is commonly found in South Africa. Although not currently controlled, various preparations have been used clinically for treatment of anxiety, depression, and stress. This is the first submission of this material to the laboratory.



**Photo 7**

**- INTELLIGENCE ALERT -**

**UNUSUAL MIXTURE OF METHAMPHETAMINE HYDROCHLORIDE,  
AMPHETAMINE, AND N,N-DIMETHYLAMPHETAMINE  
NEAR CAMP PENDLETON, CALIFORNIA**

The DEA Southwest Laboratory (Vista, California) recently received a knotted plastic bag containing a waxy, dark brown solid with the appearance and consistency of chocolate (see Photo 8). The exhibit was seized near the South Gate of Camp Pendleton, California by Immigration and Customs Enforcement personnel (Santa Ana Office), pursuant to a warrant search (no further details). Despite the appearance, there was no noticeable odor. Analysis of the material (total net mass 176.7 grams) by GC/FID (underivatized and following derivatization with TPC), FTIR, GC/MS, and LC identified a mixture of 76.6% methamphetamine hydrochloride, 10.4% amphetamine (calculated as the hydrochloride), and 9.1%



**Photo 8**

N,N-dimethylamphetamine (calculated as the hydrochloride). The methamphetamine was non-racemic, with the *l*- isomer in greater abundance, while the amphetamine was racemic (the isomer composition of the dimethylamphetamine was not determined). The cause for the unusual color - unexpected for a sample containing 96% total amphetamines - was not determined. This was the second such submission to the Southwest Laboratory - a similar exhibit was submitted in 2002.

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**- INTELLIGENCE ALERT -**

**EXTREMELY HARD, UNUSUALLY WELL FORMED BRICKS OF HIGH  
PURITY “ICE” METHAMPHETAMINE IN LAREDO, TEXAS**

The DEA South Central Laboratory (Dallas, Texas) recently received 23 plastic-wrapped bricks of white crystalline material, suspected methamphetamine (see Photo 9, next page). The exhibits were seized by U.S. Border Patrol personnel during a routine search at a checkpoint in Laredo, Texas. The bricks were extremely hard, requiring a hammer and chisel to break apart, and were also unusually well formed and unusually shaped (16.5 x 8 x 8 centimeter rectangles with exact, squared-off corners (see Photo 10, next page)). Analysis of the material (total net mass 22.80 kilograms) by FTIR-ATR, GC/MS, GC/FID and LC/MS confirmed 99.7% *d*-methamphetamine hydrochloride. The South Central Laboratory routinely receives “Ice” methamphetamine; however, this is the first submission of methamphetamine bricks with these unusual characteristics.



**Photo 9**



**Photo 10**

[Editor's Notes: The high density, extreme hardness, consistent dimensions, and exact edges of these bricks suggest that they were formed using industrial quality molds and high-pressure mechanical compression.]

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### **- INTELLIGENCE ALERT -**

#### **COCAINE IN A UKELELE, FABRIC BAGS, AND A JEWELRY BOX AT THE ORLANDO, FLORIDA AIRPORT**

The DEA Southeast Laboratory (Miami, Florida) recently received a jewelry box, two decorative fabric bags, and a wooden ukelele, all containing white powders, suspected cocaine (see Photos 11 - 12, below, and 13 - 16, next page). The exhibits were seized by Immigration and Customs Enforcement personnel at the Orlando, Florida airport, from a passenger arriving from Panama City, Panama. In the case of the ukelele and the fabric bags, the powders were sealed in plastic, which was in turn wrapped in aluminum foil. In the jewelry box, the powder was wrapped in aluminum foil, that was concealed between the wooden box and the inner lining. Analysis of the powders (total net mass 525.6 grams) by GC/MS and FTIR confirmed 79 - 95% cocaine hydrochloride. These were the first submissions of cocaine smuggled in a ukelele or a jewelry box to the Southeast Laboratory.



**Photo 11**



**Photo 12**





Photo 13 (One of Two Bags)



Photo 14



Photo 15



Photo 16

## - INTELLIGENCE ALERT -

### HEROIN IN RATTAN SHADES IN MEMPHIS, TENNESSEE

The DEA Northeast Laboratory (New York, New York) recently received two rattan style window blinds (woven wood window shades) that contained an off-white colored powder, suspected heroin (see Photo 17). The exhibits were seized in Memphis, Tennessee, but were submitted to the laboratory by personnel from the New York City Office of Customs and Border Protection (no further details). The powder (total net mass 1,427 grams) was inserted in plastic straws that had been substituted for several of the wooden dowels in the shades (see Photo 18). Analysis by GC/MS, GC/FID, and FTIR-ATR confirmed 79.8% heroin hydrochloride. The Northeast Laboratory routinely receives heroin concealed in consumer products, but this was the first submission of this particular smuggling technique.



Photo 17



Photo 18

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### SELECTED REFERENCES

[The Selected References section is a compilation of recent publications of presumed interest to forensic chemists. Unless otherwise stated, all listed citations are published in English. Abbreviated mailing address information duplicates that provided by the abstracting service. Patents and Proceedings are reported only by their *Chemical Abstracts* citation number.]

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3. Kato N, Fujita S, Ohta H, Fukuba M, Toriba A, Hayakawa K. **Thin layer chromatography/fluorescence detection of 3,4-methylenedioxymethamphetamine and related compounds.** Journal of Forensic Sciences 2008;53(6):1367-71. [Editor's Notes: The presented system was developed for MDMA, MDA, MDEA, MBDB, N-methyl-1-(3,4-methylenedioxyphenyl)-3-butanamine, and MDDMA. Following elution, the plates are sprayed with a solution of sodium hypochlorite, potassium hexacyanoferrate (III), and sodium hydroxide, then heated for 3 minutes at 100°C. Following development, blue fluorescent spots were observed under UV irradiation. A toxicological application is presented. Contact: Scientific Crime Laboratory, Kanagawa Prefectural Police Headquarters, 155-1 Yamashita-cho, Naka-ku, Yokohama 231-0023, Japan.]
  
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1. Thevis M, Editor. Sports Drug Testing by Mass Spectrometry. IM Publications: Chichester, UK, 2008.

\* \* \* \* \*

## Microgram email Address Change

Effective January 1st, 2009 the email address for the *Microgram* Editor will be:

[DEA-Microgram-2009-at-mailsnare.net](mailto:DEA-Microgram-2009-at-mailsnare.net) (Replace “-at-” with “@”)

The current email address ( [DEA-Microgram-2008-at-mailsnare.net](mailto:DEA-Microgram-2008-at-mailsnare.net) ) will be monitored until January 31st, 2009. An automated response will direct senders to the new address until April 1st, 2009, at which point the account will lapse.

Important Notes to All Subscribers: All subscribers with filters on their accounts should immediately “whitelist” the [DEA-Microgram-2009-at-mailsnare.net](mailto:DEA-Microgram-2009-at-mailsnare.net) email address. In addition, it is recommended that the current and previous email addresses used for *Microgram* ( [DEA-Microgram-2008-at-mailsnare.net](mailto:DEA-Microgram-2008-at-mailsnare.net) ) be automatically filtered (blocked) after January 1st, 2009. This address will no longer be used by *Microgram* after this date; therefore, any subsequent emails from these addresses will be spam - note that the *Microgram* email addresses are routinely “hijacked” and used to send spam, and this fraudulent use will continue and likely will increase in future years (it is not possible for the *Microgram* Editor to prevent or control this problem).

All subscribers should notify their IT security personnel of all the above changes.

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# Microgram

## *Bulletin*

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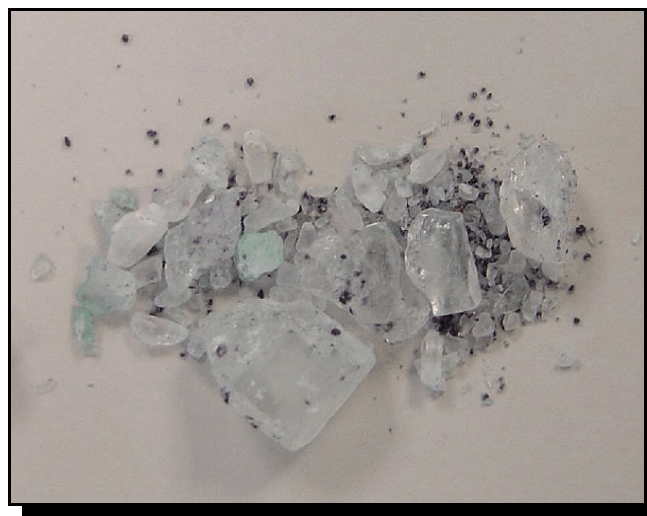
The U.S. Attorney General has determined that the publication of this periodical is necessary in the transaction of the public business required by the Department of Justice. Information, instructions, and disclaimers are published in the January issues.

- JANUARY 2009 -

- INTELLIGENCE ALERT -

### **“FLAVORED METHAMPHETAMINE” IN EVERETT, WASHINGTON**

The DEA Western Laboratory (San Francisco, California) recently received a ziplock plastic bag containing a mixture of translucent crystals and tiny purple specks that had a distinct grape candy-like odor, purported to be “flavored methamphetamine” (see Photo 1). The exhibit was acquired by DEA Special Agents in Everett, Washington. Analysis of the exhibit (total net mass 26.7 grams) by FTIR, GC/MS, GC/IRD, and HPLC confirmed 1.1% methamphetamine (salt form undetermined), diluted with dimethylsulfone and sucrose; the sample appeared to be mostly dimethylsulfone, based on the FTIR spectrum. It is possible that the tiny purple specks in the exhibit were bits of a grape flavored candy or lollipop, but this was not formally determined. This is the first such submission to the Western Laboratory.



**Photo 1**

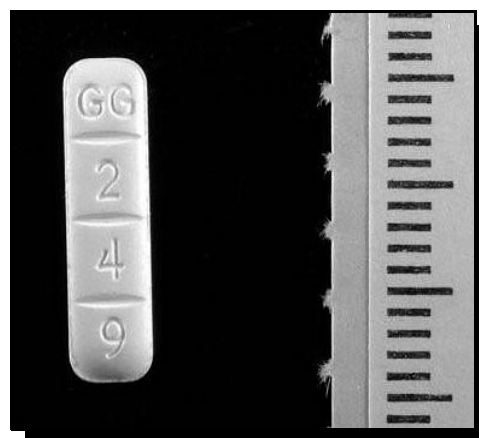
[Editor's Notes: "Flavored methamphetamine" (most notably "strawberry meth") has received extensive and often alarmist coverage in the mass media over the past two years. However, this is the first confirmed sample of "flavored methamphetamine" submitted to a DEA laboratory, and is also the first such report by any laboratory to *Microgram*. A small number of exhibits with unusual colors have been submitted to the South Central Laboratory (Dallas, Texas) over the past two years; however, none of the latter samples had any noticeable fruit or candy-like odors. Several exhibits of "flavored cocaine" were reported by the Western Laboratory; see: "Flavored Cocaine" in Modesto, California. *Microgram Bulletin* 2008;41(7):60.]

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**- INTELLIGENCE ALERT -**

**ALPRAZOLAM MIMIC TABLETS (ACTUALLY CONTAINING  
EITHER MELATONIN OR AN UNUSUAL, NON-CONTROLLED  
BENZODIAZEPINE) IN NORTHWEST FLORIDA**

The Florida Department of Law Enforcement (Pensacola Regional Operations Center) recently received multiple submissions of apparent Sandoz 2 milligram alprazolam tablets. The tablets were white, rectangular, imprinted with the "GG 2 4 9" logo, and came in two different weights, either 0.21 grams each (see Photo 2) or 0.38 grams each (see Photo 3). The exhibits (containing from 1 - 35 tablets) were seized by various law enforcement agencies across northwestern Florida. Analysis by GC/MS, however, indicated no alprazolam in either tablet type. The lighter tablets contained a non-controlled benzodiazepine, tentatively identified as 5-(4-chlorophenyl)-7-bromo-1,4-benzodiazepin-2-one (not confirmed; not quantitated but approximately 1 - 2 milligrams based on the TIC). The heavier tablets contained melatonin (not confirmed; not quantitated but a high loading based on the TIC). These are the first ever pharmaceutical mimic tablets submitted to the FDLE laboratory system.



**Photo 2**

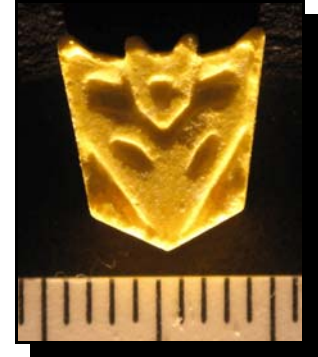


**Photo 3**

**- INTELLIGENCE ALERT -**

**ECSTASY MIMIC TABLETS (ACTUALLY CONTAINING N-BENZYL-PIPERAZINE (BZP), 1-(3-TRIFLUOROMETHYL)PHENYLPYPERAZINE (TFMPP), AND CAFFEINE) IN FINDLAY, OHIO**

The Ohio Bureau of Criminal Identification and Investigation in Bowling Green recently received five plastic bags each containing 10 unusually shaped, yellow tablets with a “Decepticons” logo, suspected Ecstasy (see Photo 4). The tablets were acquired in Findlay, Ohio, by the Metrich Drug Enforcement Unit (details sensitive). Analysis of the tablets (total net mass 14.2 grams) by GC/FID and GC/MS, however, indicated not MDMA but rather a mixture of N-benzylpiperazine (BZP), 1-(3-trifluoromethyl)phenylpiperazine (TFMPP), and caffeine (not quantitated). The laboratory has previously received numerous submissions of tablets containing BZP/TFMPP mixtures, but this was the first submission of Ecstasy or Ecstasy mimic tablets with this shape and logo to the laboratory.



**Photo 4**

[Editor’s Notes: According to the analyst, the “Decepticons” are the antagonists in the fictional “Transformers” universe. This is the first report of this tablet shape and logo to *Microgram*.]

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**- INTELLIGENCE ALERT -**

**MARIJUANA CONCEALED IN A TEDDY BEAR IN LITTLE ROCK, ARKANSAS**

The Arkansas State Crime Laboratory (Little Rock) recently received a teddy bear containing a package of plant material, suspected marijuana (see Photo 5). The exhibit was being shipped by an express parcel service, and was seized in Little Rock by the Little Rock Police Department. The bear had a strong odor of cologne or perfume, and the plant material was sealed in multiple ziplock plastic bags. Analysis of the plant material (total net mass 27.5 grams) by microscopy, TLC, and modified Duquenois-Levine test confirmed marijuana. This is the first submission of this type to the laboratory.



**Photo 5**

[Editor’s Notes: The bear is about 12 inches long. The bag is quart-sized.]



**- INTELLIGENCE ALERT -**

**FOODSTUFFS CONTAINING THC IN NAVAJO COUNTY, ARIZONA**

The Arizona Department of Public Safety - Northern Regional Crime Laboratory (Flagstaff) recently received a multi-exhibit submission including marijuana (490 grams), 50 small, intact marijuana plants, eight commercially packaged foodstuffs labelled “Incredible Edibles,” purported to contain THC (see Photo 6a), and four “home” packaged foodstuffs with lower quality labels, also purported to contain THC (see Photos 6 - 9). The exhibits were seized in Navajo County (northeast Arizona) by personnel from the Arizona Department of Public Safety (no further details). The labels on the Incredible Edibles exhibits included “eat or freeze by” dates, THC quantities, and weights (see Photo 6b). The “home” packaged foodstuffs were in ziplock plastic or cellophane bags, and their labels contained less specific information concerning content. Analysis by color testing (Duquenois-Levine - positive) and GC/MS of pet ether extracts confirmed THC in all 12 foodstuffs (not quantitated). These were the first submissions of THC-containing foodstuffs commercial packaging to the laboratory. Investigative intelligence indicated that the “Incredible Edibles” foodstuffs are products of a marijuana distributor in California. The sources of the “home” packaged items were not determined.



**Photo 6a - Six Cookies and Two  
Rice Krispie-Like Treats**



**Photo 6b**



**Photo 7 - Cookie**



**Photo 8 - Muffin**



**Photo 9 (There  
were two of these  
“Hash Brownies”).**



**- INTELLIGENCE ALERT -**

**HEROIN TABLETS (FROM THE PHILLIPINES) AT THE SAN FRANCISCO (CALIFORNIA) INTERNATIONAL AIRPORT**

The Customs and Border Protection (CBP) San Francisco Laboratory (California) recently received two vacuum-sealed plastic packages containing a combined total of 180 small, light-brown/tan tablets, 4 millimeters in diameter, unknowns/suspected controlled substance(s) (see Photo 10). The exhibits were seized by CBP Officers at the San Francisco International Airport Air Mail Center; both had been mailed from the Phillippines to individuals in Arizona and Minnesota, respectively (details sensitive). Analysis of the tablets (total net mass 11 grams) by GC/MS indicated heroin (not quantitated; salt form not determined). The laboratory has previously received heroin in capsule form, but this was the first submission of heroin in tablet form. The tablets are believed to be of clandestine origin.



**Photo 10**

\* \* \* \* \*

**- INTELLIGENCE ALERT -**

**UNUSUAL RACEMIC METHAMPHETAMINE SAMPLE IN DETROIT, MICHIGAN (LIKELY PREPARED BY A BOROHYDRIDE REDUCTION METHOD)**

The Special Testing and Research Laboratory (Dulles, Virginia) recently received an evidence envelope containing a small amount of a pasty, orange colored material, suspected methamphetamine (see Photo 11). The sample was an exemplar from five kilogram-sized bricks seized in Detroit, Michigan, by Customs and Border Protection Officers, incidental to a search of vehicle entering from Canada. Analysis of the material (total net mass approximately 3 grams) by GC/MS and CE indicated a mixture of 78% *d,l*-methamphetamine hydrochloride and 16% 1-phenyl-2-propanol. Detailed profiling by GC/MS and ICP/MS confirmed the presence of marker impurities corresponding to a reductive amination route, and (unusually) an extremely high boron concentration. The collective results indicate synthesis via a reductive amination of 1-phenyl-2-propanone (phenylacetone, P2P)



**Photo 11**

using sodium borohydride or a similar compound. This is the first such submission to the Special Testing and Research Laboratory.

[Editor's Notes: MDMA is typically prepared by clandestine chemists in Canada via reductive amination of 1-(3',4'-methylenedioxyphenyl)-2-propanone (MDP2P) using sodium borohydride or sodium cyanoborohydride. Previous reports from Canadian law enforcement personnel have indicated that bulk quantities of MDP2P and P2P are occasionally co-smuggled into Canada. It would appear that this sample resulted from an attempted MDMA prep that used the wrong precursor (i.e., P2P). The contaminant 1-phenyl-2-propanol results from reduction of P2P, and the large amount of it (and the boron compounds) in the sample confirms a very poorly executed "cook." The physiological consequences of abuse of methamphetamine contaminated with excessive 1-phenyl-2-propanol and boron compounds are unknown.]

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### **- INTELLIGENCE ALERT -**

#### **COCAINE SMUGGLED IN AN ANGEL STATUE IN MIAMI, FLORIDA**

The DEA Mid-Atlantic Laboratory (Largo, Maryland) recently received a statue of an angel that contained four plastic bags of white powder, suspected cocaine (see Photos 12 - 13). The exhibit was being shipped by an express parcel service, and was initially seized in Miami, Florida by Immigration and Customs Enforcement personnel; it was submitted to the laboratory after a controlled delivery in the Washington, DC area. Analysis of the powder (total net mass 302.6 grams) by FT/IR, GC, and GC/MS confirmed 62.4% cocaine hydrochloride, adulterated with lidocaine and levamisole. The Mid-Atlantic Laboratory has previously received similar exhibits.

[Editor's Note: The brown-gray powder in Photo 13 is some of the cement mixture used to assemble and fill the statue.]



**Photo 12**



**Photo 13**

## - INTELLIGENCE ALERT -

### ***L*-METHAMPHETAMINE IN AUSTIN, TEXAS**

The Austin (Texas) Police Department Chemistry Laboratory recently received two ziplock plastic bags, each containing a crystalline material, suspected methamphetamine (no photos). The exhibits were seized in Austin by the Austin Police Department (no further details). Analysis of the first exhibit (total net mass 20.13 grams) by FTIR, GC/MS, UV, and by GC/FID following derivatization with (S)-(-)-N-(trifluoroacetyl)prolyl chloride indicated 96% *L*-methamphetamine hydrochloride. Analysis of the second exhibit (total net mass 138.84 grams) by the same techniques indicated 72% *L*-methamphetamine hydrochloride. These are the first submissions of *L*-methamphetamine to the laboratory.

\* \* \* \* \*

## SELECTED REFERENCES

[The Selected References section is a compilation of recent publications of presumed interest to forensic chemists. Unless otherwise stated, all listed citations are published in English. Abbreviated mailing address information duplicates that provided by the abstracting service. Patents and Proceedings are reported only by their *Chemical Abstracts* citation number.]

1. Bonilla DA, Penuela LF, Sierra N, Diaz JE, Rojas JH. **Development and validation of an analytical methodology for cocaine hydrochloride determination in a synthetic polymer by ultraviolet spectrometry.** *Vitae* 2008;15(1):103-12. [Editor's Notes: The cocaine was extracted with 0.5 N H<sub>2</sub>SO<sub>4</sub> and quantitated in the extraction solution at 233 nm. This article is written in Spanish. Contact: Seccion de Analitica, Departamento de Farmacia, Universidad Nacional de Colombia, Bogota A.A. 14490, Colombia.]
2. Frost N, Griffiths P. Assessing illicit drugs in wastewater - Potential and limitations of a new monitoring approach. Luxembourg: European Monitoring Centre for Drugs and Drug Addiction, 2008. [Editor's Notes: An overview and review (6 chapters from contributing authors). Contact: EMCDDA, Rua da Cruz de Santa Apolonia 23-25, 1149-045 Lisbon, Portugal.]
3. Gosav S, Dinica R, Praisler M. **Choosing between GC-FTIR and GC-MS spectra for an efficient intelligent identification of illicit amphetamines.** *Journal of Molecular Structure* 2008;887(1-3):269-78. [Editor's Notes: Presents a comparative analysis between several Artificial Neural Network systems designed for the identification of illicit amphetamines based on their GC/FTIR and GC/MS spectra. Structure-activity relationships were incorporated into the knowledge base, allowing the systems to classify the amphetamines according to their toxicological activity (i.e., stimulant or hallucinogenic). The results show that GC-FTIR data are much more relevant for these classifications. Contact: Department of Physics, Faculty of Sciences, "Dunarea de Jos" University, 800201 Galati, Rom.]
4. LeBeau MA. **Guidance for improved detection of drugs used to facilitate crimes.** *Therapeutic Drug Monitoring* 2008;30(2):229-33. [Editor's Notes: A review, providing information on the manner in which drug-facilitated crimes occur, the drugs that are used, and recommendations to improve the detection of these drugs through toxicological analyses. Contact: FBI Laboratory, Federal Bureau of Investigation, Quantico, VA 22135.]

5. Liu M, Song C, Qiao J, Wang Y. **Component and purity of retail heroin and concentration ratio of morphine to codeine in urine of heroin abusers.** Zhongguo Yaowu Yilaixing Zazhi 2007;16(5):386-9. [Editor's Notes: Focus is toxicological, but includes basic analyses of 441 samples of street-level heroin. The composition of the heroin varied from 95.2% to 0%. The acetylcodeine varied from 89.3% to 1.6%. 25 samples contained more acetylcodeine than heroin. The toxicological results indicated that the ratio of morphine to codeine in the urine of heroin abusers was significantly different than the ratio of heroin to acetylcodeine in the retail heroin. This article is written in Chinese. Contact: School of Forensic Medicine, Shanxi Medical University, Taiyuan 030001, Peop. Rep. China.]
6. Nie J, Wu H, Wang X, Zhang Y, Zhu S, Yu R. **Determination of testosterone propionate in cosmetics using excitation-emission matrix fluorescence based on oxidation derivatization with the aid of second-order calibration methods.** Analytica Chimica Acta 2008;628(1):24-32. [Editor's Notes: The title technique was employed to analyze for testosterone propionate in several "complicated" cosmetics. Testosterone propionate was transformed into a highly fluorescent derivative (not specified) via oxidation with concentrated H<sub>2</sub>SO<sub>4</sub>. Contact: State Key Laboratory of Chemo/Biosensing and Chemometrics, College of Chemistry and Chemical Engineering, Hunan University, Changsha, Peop. Rep. China 410082.]

#### Additional References of Possible Interest:

1. Frisk T, Sandstroem N, Eng L, van der Wijngaart W, Maansson P, Stemme G. **An integrated QCM-based narcotics sensing microsystem.** Lab on a Chip 2008;8(10):1648-57. [Editor's Notes: Presents the design, fabrication, and successful testing of a 14 × 14 × 4 mm<sup>3</sup> "integrated electronic narcotics sensing system" (Note: QCM = quartz crystal microbalance). The system was tested on cocaine and MDMA, with successful detection down to 100 and 200 ngs, respectively. Contact: Microsystem Technology Lab, KTH - Royal Institute of Technology, Stockholm, Swed. (no further addressing information was provided).]
2. Tcheremissine OV. **Is quetiapine a drug of abuse? Reexamining the issue of addiction.** Expert Opinion on Drug Safety 2008;7(6):739-48. [Editor's Notes: A minor review of the literature search from 1991 to mid-2008 (9 articles). Contact: Carolinas HealthCare System - Behavioral Health Center, Department of Psychiatry, 501 Billingsley Road, Charlotte, NC 28211.]

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## THE JOURNAL/TEXTBOOK COLLECTION EXCHANGE

The Journal/Textbook Collection Exchange is a service intended to facilitate the transfer of unwanted journals and textbooks to forensic libraries or other *Microgram* subscribers. At present, this service is offered once a quarter (in January, April, July, and October). The current donations are listed below. The offers are First Come/First Serve (except **libraries have preference**). There are no charges to the requestor. Please provide a full mailing address in the request. **Important!:** Do not provide an address that irradiates mail!

*Federal Code and Rules* - 2007 Edition

**All subscribers are encouraged to donate surplus or unwanted items/collections.** Reference texts and long runs of forensic/analytical journals are of particular interest; however, even single issues are

worthwhile, and may fill a hole in an existing collection. If interested, please consult the *Microgram* website or contact the *Microgram* Editor for further instructions.

The next offering of journals and textbooks will be in the April 2009 issue of *Microgram Bulletin*.

\* \* \* \* \*

## THE DEA FY 2009 STATE AND LOCAL FORENSIC CHEMISTS SEMINAR SCHEDULE

The remaining FY 2009 schedule for the State and Local Forensic Chemists Seminar is as follows:

March 2-6, 2009  
June 1-5, 2009  
September 14-18, 2009

The school is open only to forensic chemists working for law enforcement agencies, and is intended for chemists who have completed their agency's internal training program and have also been working on the bench for at least one year. There is no tuition charge. The course is held at the Hyatt Place Dulles North Hotel in Sterling, Virginia (near the Washington/Dulles International Airport). A copy of the application form is reproduced on the last page of the August 2004 issue of *Microgram Bulletin*. (See: <http://www.dea.gov/programs/forensicsci/microgram/mg0804/aug04.pdf>) Completed applications should be mailed to the Special Testing and Research Laboratory (Attention: J. Head) at: 22624 Dulles Summit Court, Dulles, VA 20166. For additional information, call 703/668-3349.

\* \* \* \* \*

## Microgram email Address Change

Effective January 1st, 2009 the email address for the *Microgram* Editor changed to:

[DEA-Microgram-2009-at-mailsnare.net](mailto:DEA-Microgram-2009-at-mailsnare.net) (Replace “-at-” with “@”)

The previous email address ( [DEA-Microgram-2008-at-mailsnare.net](mailto:DEA-Microgram-2008-at-mailsnare.net) ) will be monitored until January 31st, 2009. After January 31st, an automated response will direct senders to the new address until April 1st, 2009, at which point the account will lapse.

Important Notes to All Subscribers: All subscribers with filters on their accounts should immediately “whitelist” the [DEA-Microgram-2009-at-mailsnare.net](mailto:DEA-Microgram-2009-at-mailsnare.net) email address. In addition, it is recommended that the previous email addresses used for *Microgram* ( [DEA-Microgram-2008-at-mailsnare.net](mailto:DEA-Microgram-2008-at-mailsnare.net) ) be automatically filtered (blocked). This address was no longer be used by *Microgram* after January 1st; therefore, any subsequent emails from these addresses will be spam - note that the *Microgram* email addresses are routinely “hijacked” and used to send spam, and this fraudulent use will continue and likely will increase in future years (it is not possible for the *Microgram* Editor to prevent or control this problem).

All subscribers should notify their IT security personnel of all the above changes.

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## Information and Instructions for *Microgram Bulletin*

[Editor's Preface: The following information and instructions are derived from the *Microgram* website < <http://www.dea.gov/programs/forensicsci/microgram/index.html> >, and are provided here for the convenience of those subscribers who are only receiving printed "circulation" copies of *Microgram Bulletin* at their Offices.]

### **General Information**

*Microgram Bulletin* is a monthly newsletter published by the U.S. Drug Enforcement Administration's Office of Forensic Sciences, and is primarily intended to assist and serve forensic scientists concerned with the detection and analyses of suspected controlled substances for forensic/law enforcement purposes.

### **Access to *Microgram Bulletin***

*Microgram Bulletin* is unclassified (as of the January 2003 issue), and is published on the DEA public access website (see the above URL). At this time, *Microgram Bulletin* is available only electronically, and requires Internet access. Professional scientific and law enforcement personnel may request email notifications when new issues are posted (such notifications are not available to private citizens). The publications themselves are never sent electronically (that is, as attachments).

Requests to be added to the email notification list should preferably be submitted via email to the *Microgram* Editor at: [DEA-Microgram-2009-at-mailsnare.net](mailto:DEA-Microgram-2009-at-mailsnare.net) Requests can also be mailed to: DEA Headquarters; Attn: Office of Forensic Sciences/Microgram Editor; 8701 Morrisette Drive; Springfield, VA 22152. All requests to be added to the *Microgram* email notification list should include the following **Standard Contact Information**:

- \* The Full Name and Mailing Address of Submitting Laboratory or Office;
- \* The Full Name, Title (Laboratory Director, Assistant Special Agent in Charge, Librarian, etc.), Phone Number, FAX Number, and Preferred email Address of the Submitting Individual (Note that (when possible) email notifications are mailed to titles, not names, in order to avoid problems arising from future personnel changes);
- \* If available, the generic email address for the Submitting Laboratory or Office;
- \* If a generic email address is not available, **one** stable email address for a long-term employee, who will be responsible for forwarding *Microgram* information to all of the other employees in the requestor's Office (**Note that only one email address per Office will be honored**).

Requests to be removed from the *Microgram* email notification list, or to change an existing email address, should also be sent to the *Microgram* Editor. Such requests should include all of the pertinent Standard Contact Information detailed above, and also should provide both the previous and the new email addresses.

Email notification requests/changes are usually implemented within six weeks.



### **Email Notifications** (Additional Comments)

As noted above, the email notification indicates which issue has been posted, provides the *Microgram* URL, and additional information as appropriate. Note that *Microgram* e-notices will NEVER include any attachments, or any hyperlink other than the *Microgram* URL. **This is important, because the Microgram email address is routinely hijacked and used to send spam, very commonly including malicious attachments.** For this reason, all subscribers are urged to have current anti-viral, anti-spyware, and firewall programs in operation. However, in order to ensure that the email notifications are not filtered as spam, the [DEA-Microgram-2009 -at- mailsnare](#) email address must be “whitelisted” by the Office’s ISP.

### **Costs**

Access to *Microgram Bulletin* is free.

### **Submissions to Microgram Bulletin**

*Microgram Bulletin* includes Intelligence Alerts, Intelligence Briefs, Safety Alerts, Selected Intelligence Briefs, Selected Literature References, Meeting Announcements, Employment Opportunities, pertinent sections from the Code of Federal Regulations, Columns of topical importance, and similar material of interest to the counter-drug community. Explanatory details for most of the above types of submission are detailed below, and typical examples are published in most issues of *Microgram Bulletin*.

All submissions must be in English. Because *Microgram Bulletin* is unclassified, **case sensitive information should not be submitted!** All submissions should, whenever possible, be submitted electronically, as straight email or as an IBM® PC-compatible Corel WordPerfect® or Microsoft Word® attachment, to: [DEA-Microgram-2009 -at- mailsnare.net](#) Current versions of Corel WordPerfect® or Microsoft Word® (defined as having release dates less than 5 years old) should be utilized. If email submission is not possible, submissions may be mailed to: DEA Headquarters; Attn: Office of Forensic Sciences/Microgram Editor; 8701 Morrisette Drive; Springfield, VA 22152. Hard copy mailings should be accompanied by an electronic version on either a 3 ½ inch IBM® PC-compatible diskette or a standard CD-R. **Note that diskettes should be mailed in an irradiation-proof protective sleeve, and the mailing envelope should be marked: “Warning - Contains Electronic Media - Do Not Irradiate”.** Note also that mailed submissions may be subject to lengthy handling delays beyond the control of the Office of Forensic Sciences, and electronic media sent through the mail may be destroyed en route by sanitizing procedures, despite protective measures and written warnings. All submissions should include the following **Contact Information:** The Full Name and Address of Submitting Laboratory or Office, and the Full Name, Phone Number, FAX Number, and Preferred email Address of the Submitting Individual.

**Intelligence Alerts and Briefs** are concise synopses of the physical and chemical characteristics of novel and/or interesting exhibits submitted to law enforcement laboratories involved in the detection and analyses of suspected controlled substances for forensic/law enforcement purposes. Alerts have some unusual aspect, such as a novel drug, an atypical formulation, or a new smuggling technique, whereas Briefs are reports of routine analyses (that is, that confirmed what was suspected/expected). Both Alerts and Briefs should include descriptive details adhering to (as appropriate) the following outline:

What laboratory did the analysis? (Full Name)

Where is the laboratory located?

What agency seized the exhibit?

Where was the exhibit seized? (If an obscure locale, give distance and direction from the nearest city)

Were there any interesting (but non-sensitive) aspects of the seizure (traffic stop, unusual smuggling technique, at a “Rave,” etc.)

What controlled substance was suspected upon submission?  
Detailed physical description (appearance, dimensions, logos, odor, packaging, etc.)  
Quantities (numbers of tablets, packages or bricks, average mass, total net mass, etc.)  
Photos (see additional information, below)  
What techniques were used to analyze the exhibit?  
Actual composition of the exhibit?  
Quantitation data? (if not quantitated, provide a qualitative approximation if possible)  
Adulterants and diluents? (if identified, especially if unusual)  
First seizure of this type? (if not, provide brief details of previous examples)  
Editorial comments? (if any)  
Literature references for unusual submissions? (if needed)

In order to avoid confusion, if uncommon controlled substances are identified, the description should use the full chemical name(s) of the identified substances (if desired, acronyms or street terminology (e.g., "Foxy-Methoxy", "Nexus", or "STP") can be included in parentheses after the full chemical name).

**Photographs should be provided as ATTACHMENTS, not as embedded images in documents.** Jpeg images are preferred. Photographs should be of reasonable size - 150 - 250 kbytes per photograph. Unless the scale is obvious, photographs of subject exhibit(s) should include either a metric ruled scale or a coin or bill (U.S. currency) to place the exhibit's size in context.

**Safety Alerts** are urgent communiques to the *Microgram Bulletin* readership which give notice of a specific safety issue of particular interest to forensic or crime laboratory personnel, or to law enforcement personnel dealing with controlled substances. They should include a concise synopsis of the incident(s), recommendations (if any), pertinent literature citations (if any are known), and a mechanism for providing feedback (if appropriate).

**Selected Intelligence Briefs** are reprinted (with permission) unclassified intelligence briefs of presumed interest to the *Microgram Bulletin* readership that have been previously published in restricted or non-restricted publications or websites that are also dedicated to the detection and analyses of suspected controlled substances for forensic/law enforcement purposes. Selected Intelligence Briefs must be unclassified, and should be a minimum of 1 page and a maximum of 10 pages in length (single spaced at 11 pitch Times New Roman font, including photos, tables, charts, etc.) All *Microgram Bulletin* subscribers are invited to submit such material, which must include the author's and publisher's contact information.

**Selected Literature References** is a monthly compilation of reference citations of presumed interest to the *Microgram Bulletin* readership, derived from approximately 7,500 scientific periodicals. The focus of the Selected Literature References is the detection and analysis of suspected controlled substances for forensic/law enforcement purposes. References from clinical and toxicological journals are included only if the material is considered to be of high interest to forensic chemists (for example, contains the mass spectra of an unusual substance that is not known to be published elsewhere). Note that citations from obscure periodicals may be missed, and all *Microgram Bulletin* subscribers are invited to submit citations of interest if they do not appear in *Microgram Bulletin* within three months of their publication. Of particular interest are articles from regional forensic science associations that are unlikely to be noted by any abstracting service. Citations should include a summary sentence and the primary author's contact information.

**Meeting Announcements** list upcoming meetings of presumed interest to the *Microgram Bulletin* readership. **In general, only meetings which are dedicated to forensic chemistry/forensic drug analysis or include a subsection so dedicated will be publicized in *Microgram Bulletin*.** Meeting Announcements should include the Formal Title, Sponsoring Organization, Inclusive Dates, Location

(City, State, and specific locale), Registration Deadline, Recommended Hotel (include details on special rates and deadlines where applicable), and Contact Individual's Name, Phone Number, and email Address. If available, the URL for the meeting website should also be included in the Announcement. Meeting Announcements will be posted for a maximum of three consecutive months, or (alternately) three times every other month over a five month period, but not past the registration deadline.

**Employment Opportunities** lists job announcements of presumed interest to the *Microgram Bulletin* readership. **In general, only jobs with a forensic chemistry/forensic drug analysis focus for Federal, State, or Local Crime Laboratories or Offices will be publicized in *Microgram Bulletin*.** Exceptions may be requested and will be considered on a case-by-case basis (for example, an academic position in a Forensic Chemistry Department). Employment Opportunity announcements should include the Formal Title of the Organization, Formal Title of the Laboratory or Office, Position Title, Laboratory or Office Location (City and State), Salary Range, Opening and Closing Dates, Duties, General Requirements, Specialized Requirements (if any), Application Procedures, and the Contact Individual's Name, Phone Number, email Address, and Mailing Address. If available, the URL for the agency's website, and (if available) the specific URL for the job posting should also be included in the Announcement. Employment Opportunities will be posted for a maximum of 3 consecutive months, but not past the application deadline.

#### **The Journal/Textbook Collection Exchange**

If any subscriber is interested in donating any forensic or analytical chemistry journal and/or textbook collection to a fellow subscriber or library, *Microgram Bulletin* is willing to list the offered materials and the associated contact information in a future issue (currently January, April, July, and October). The general format should follow the example in the January 2003 issue, and should be sent via email to the *Microgram* Editor at: [DEA-Microgram-2009 -at- mailsnare.net](mailto:DEA-Microgram-2009-at-mailsnare.net) Only items for donation (not for sale) will be considered for publication, and donations to libraries should adhere to journal restrictions and/or time limits (if any) on such offers.

#### **Requests for *Microgram* and/or *Microgram Bulletin* Archives, 1967 - 2002**

All issues of *Microgram* (November 1967 - March 2002) and the first nine issues of its successor *Microgram Bulletin* (April - December 2002) were and continue to be **Law Enforcement Restricted** publications, and are therefore (permanently) unavailable to the general public. [Note that this restriction includes requests made under the Freedom of Information (FOI) Act.]

However, the entire collection, individual issues, or individual sections of issues (e.g., specific articles) are available to law enforcement affiliated offices and laboratories. Requests from such offices and laboratories **must be made on official letterhead** and mailed to:

DEA Headquarters  
Attn: Office of Forensic Sciences/*Microgram* Editor  
8701 Morrisette Drive  
Springfield, VA 22152.

Requests will be sent either by CD or in hard copy (photocopy), as appropriate.

Note that requests made via email will not be honored.

## DISCLAIMERS

1) All material published in *Microgram Bulletin* is reviewed prior to publication. However, **the reliability and accuracy of all published information are the responsibility of the respective contributors, and publication in *Microgram Bulletin* implies no endorsement by the United States Department of Justice or the Drug Enforcement Administration.**

2) Due to the ease of scanning, copying, electronic manipulating, and/or reprinting, **only the posted copies of *Microgram Bulletin* (on [www.dea.gov](http://www.dea.gov)) are absolutely valid.** All other copies, whether electronic or hard, are necessarily suspect unless verified against the posted versions.

3) **WARNING!:** Due to the often lengthy time delays between the actual dates of seizures and their subsequent reporting in *Microgram Bulletin*, and also because of the often wide variety of seizure types with superficially similar physical attributes, published material cannot be utilized to visually identify controlled substances currently circulating in clandestine markets. **The United States Department of Justice and the Drug Enforcement Administration assume no liability for the use or misuse of the information published in *Microgram Bulletin*.**

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# Microgram

## *Bulletin*

**Published by:**

The Drug Enforcement Administration  
Office of Forensic Sciences  
Washington, DC 20537

The U.S. Attorney General has determined that the publication of this periodical is necessary in the transaction of the public business required by the Department of Justice. Information, instructions, and disclaimers are published in the January issues.

**- FEBRUARY 2009 -**

**- INTELLIGENCE ALERT -**

**OXYCONTIN AND OXYCONTIN MIMIC TABLETS (ACTUALLY CONTAINING TRAMADOL, DICYCLOMINE, AND DIAZEPAM) IN TARRYTOWN, NEW YORK**

The Westchester County Forensic Lab (Valhalla, New York) recently received a submission of 11 green round tablets with two different logos, all apparent OxyContin (see Photo 1). The tablets were seized by the Tarrytown Police Department, incidental to a routine traffic stop in Tarrytown. The first group of tablets (six) were marked “OC” on one face and “80” on the opposite face, and weighed approximately 270 milligrams each. The second group of tablets (five) were more poorly marked “CDN” on one face and “80” on the opposite face, and weighed approximately 249 milligrams each. The presumptive identifications of Oxycontin (i.e., containing 80 milligrams of oxycodone) for both sets of tablets were based on the Drug Identification Bible. Analysis of the “OC/80” tablets by GC/MS confirmed oxycodone (not quantitated). Analysis of the “CDN/80” tablets by GC/MS, however, indicated not oxycodone but rather a mixture of



**Photo 1**

tramadol, dicyclomine, and diazepam (not quantitated, but in an approximate 86 : 2.5 : 1 ratio based on the based on the TIC). The “OC/80” tablets are presumed to be legitimate Oxycontin tablets, while the “CDN/80” tablets are mimics of Canadian-produced Oxycontin tablets. This was the laboratory’s first encounter with OxyContin mimic tablets.

[Editor’s Notes: Tramadol is a CNS depressant and an analgesic. Dicyclomine is an antispasmodic. Similar appearing “CDN/80” tablets were recently reported by the Canadian Border Services Agency Laboratory in Ottawa; however, those tablets contained a mixture of nitrazepam, codeine, and chlorpheniramine; see: Microgram Bulletin 2008;41(9):77.]

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### **- INTELLIGENCE ALERT -**

#### **ECSTASY MIMIC TABLETS (ACTUALLY CONTAINING N-BENZYL-PIPERAZINE, 1,3-TRIFLUOROMETHYLPHENYLPIPERAZINE, 1,4-DIBENZYLPIPERAZINE, AND CAFFEINE) IN BOISE, IDAHO**

The Idaho State Police Forensics Laboratory in Meridian recently received four submissions of six types of tablets, suspected Ecstasy (see Photos 2 - 7). The tablets were acquired or seized in Boise by the Boise Area Narcotics Drug Interdiction Taskforce. The first two submissions (totalling 25 yellow Bart Simpsons and 25 blue “Autobot” Transformers) were acquired during undercover purchases. The third submission (25 each of green tablets with an Infiniti logo, orange tablets with a Batman bat logo, purple tablets with the JL Audio logo, and blue tablets with a dolphin logo); were also acquired during another undercover purchase from the same suspect (note that the four tablets in Photos 4 - 7 are all approximately the same size). The fourth submission consisted of 300 more of the same type



**Photo 2**



**Photo 3**



**Photo 4**



**Photo 5**



**Photo 6**



**Photo 7**



tablets acquired in the third undercover purchase (43 green Infiniti, 52 orange Batman bats, 90 purple JL Audios, and 115 blue dolphins), that were seized pursuant to a consent search of the suspect's room in a local motel. Analysis of the Bart Simpson and "Autobot" Transformer tablets by color testing (Marquis, secondary amine, and cobalt thiocyanate) and GC/MS, however, indicated not MDMA but rather a 1 : 3 : 1 mixture of N-benzylpiperazine (BZP), 1,3-trifluoromethylphenylpiperazine (TFMPP), and 1,4-dibenzylpiperazine, adulterated with caffeine. Analysis of the Infiniti, bat, JL Audio, and dolphin tablets (same techniques) indicated a 3 : 2 mixture of BZP and TFMPP (no 1,4-dibenzylpiperazine), again adulterated with caffeine. The various components were not formally quantitated, but were present at a fairly high loading based on the TICs. The Idaho State Police Forensic laboratories have received several similar submissions over the past few months.

[Editor's Notes: "Autobots" are characters in the fictional "Transformers" universe. The Portland Metro Forensic Laboratory of the Oregon State Police recently reported a similar seizure including different color Bart Simpson and "Autobot" tablets, that were both found to contain a mixture of BZP and TFMPP; see: *Microgram Bulletin* 2008;41(12):105. Similar "Decepticon" Transformer tablets (also a different color) were also reported by the Ohio Bureau of Criminal Identification and Investigation Laboratory in Bowling Green, and were found to contain a mixture of BZP, TFMPP, and caffeine; see: *Microgram Bulletin* 2009;42(1):3. In contrast to most Ecstasy and Ecstasy mimic tablets, these Bart Simpson and "Transformers"-type tablets have been very detailed and well-pressed, and more resembled small candies or children's chewable vitamins; based on reports to date to *Microgram*, however, none appear to actually contain any MDMA, but rather only mixtures of piperazines.]

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### **- INTELLIGENCE ALERT -**

#### **RECORD SEIZURE OF PHENCYCLIDINE IN JACKSON, MISSISSIPPI**

The Mississippi Crime Laboratory in Jackson recently received two plastic bottles containing a combined total of 875 milliliters of a straw-colored liquid with a strong ether-like odor, that field tested positive for phencyclidine (PCP). The exhibits (see Photo 8) had been mailed to an abandoned building in Jackson, and were seized by Mississippi Bureau of Narcotics agents. The caps on both bottles had been further sealed with electrical tape. Preliminary analysis by FTIR confirmed diethyl ether. Further analysis by GC/MS confirmed PCP (not formally quantitated, but a relatively high loading based on the TIC). This was the first submission of PCP to the Mississippi Crime Laboratory system since 2003, and was also the largest ever such submission.



**Photo 8 (in an Evidence Envelope)**

**- INTELLIGENCE ALERT -**

**COCAINE SMUGGLED IN “CHURROS” (“SPANISH DOUGHNUTS”)  
AT JFK INTERNATIONAL AIRPORT**

The DEA Northeast Laboratory (New York, New York) recently received a submission of 192 “Churros,” each containing a plastic-wrapped cylinder of an off-white powder, suspected cocaine (see Photo 9). The exhibits were seized by Immigration and Customs Enforcement personnel from mail arriving at JFK International Airport (New York) on a flight from Guyana. Each individual “Churro” was approximately 3.0 inches long by 0.75 inch in diameter. Analysis of the powder (total net mass 1.15 kilograms) by GC/FID, GC/MS, and FTIR/ATR confirmed 82.2% cocaine hydrochloride, adulterated with levamisole (not quantitated). This was the first submission of “Churros” (or of any type of fried food) being used as a concealment technique to the Northeast Laboratory.



**Photo 9**

[Editor’s Notes: “Churros” (sometimes called “Spanish doughnuts”) are fried-dough pastries.]

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**- INTELLIGENCE ALERT -**

**PROTECTIVE PLASTIC COVER (CONTAINING COCAINE) IN COLOMBIA**

The DEA Southeast Laboratory (Miami, Florida) recently received a magazine page coated in a thick plastic “protective” covering (see Photo 10); the plastic was suspected to contain cocaine. The exhibit was provided to DEA special agents in Bogota, Colombia (details sensitive). Analysis of the plastic (thickness approximately 1 millimeter, total net mass 14.2 grams) by GC/FID, GC/MS, and FTIR/ATR confirmed 21.5 % cocaine base (equalling 3.1 grams of cocaine base) adulterated with levamisole. Intelligence provided to the DEA special agents indicates that this plastic is being used to coat calendars, photos, and similar items, and is also being added into automobile paints. This is the first submission of this type exhibit to the Southeast Laboratory.



**Photo 10**

**- INTELLIGENCE ALERT -**

**COCAINE BRICKS WRAPPED IN LEAD SHEETING IN PECOS, TEXAS**

The DEA South Central Laboratory (Dallas, Texas) recently received eight bricks of compressed white powder, suspected cocaine. The exhibits were seized by a Texas Department of Public Safety Trooper incidental to a routine traffic stop in Pecos. Four bricks were half-kilogram sized, with typical black tape and clear plastic wrappings. The other four bricks were standard kilogram sized, also wrapped in black tape - but quite heavy. Upon removal of the black tape, the next layer was found to be folded lead sheeting (see Photo 11). Upon unfolding, the cocaine bricks were further wrapped in clear plastic. Analysis of the powder (total net mass for all eight bricks 5.99 kilograms) by FTIR/ATR, GC/MS, GC/FID, and LC/MS confirmed 88.6% cocaine hydrochloride. This is believed to be the first ever submission of lead wrapped cocaine bricks to the South Central Laboratory. The bricks were not actually encased (sealed) in lead; therefore, the reasoning behind this concealment technique is unclear.



**Photo 11**

\* \* \* \* \*

**- INTELLIGENCE ALERT -**

**MARIJUANA SPRINKLED WITH MORPHINE SULFATE  
POWDER IN VISTA, CALIFORNIA**

The DEA Southwest Laboratory (Vista, California) recently received a small glass screw-top jar containing 1.1 grams of plant material, apparent marijuana. The exhibit was seized by DEA special agents in Vista from the residence of a physician who was under investigation for the illegal prescribing and dispensing of controlled substances. Routine analysis of the plant material confirmed marijuana, but closer examination showed it had also been sprinkled with a tan powder (see Photo 12). Analysis of the powder by color testing (Marquis - positive), GC/MS, and FTIR/ATR indicated morphine sulfate (weight determination and quantitation not possible). No other opiates were detected; therefore, it is presumed that the powder was pharmaceutical (i.e., high purity) morphine sulfate. This was the first ever such submission to the Southwest Laboratory.



**Photo 12**



## SELECTED REFERENCES

[The Selected References section is a compilation of recent publications of presumed interest to forensic chemists. Unless otherwise stated, all listed citations are published in English. Abbreviated mailing address information duplicates that provided by the abstracting service. Patents and Proceedings are reported only by their *Chemical Abstracts* citation number.]

1. Arndt T. **Tilidin. Opioid analgesics with abuse and dependency potential.** MTA Dialog 2008;9(9):754. [Editor's Notes: A review of the analysis of Tilidine (Ethyl 2-(N,N-dimethyl-amino)-1-phenylcyclohex-3-enecarboxylate). This article is written in German. Contact: Bioscientia GmbH, D-55218 Ingelheim, Germany.]
2. Bonadio F, Margot P, Delemont O, Esseiva P. **Headspace solid-phase microextraction (HS-SPME) and liquid-liquid extraction (LLE): Comparison of the performance in classification of ecstasy tablets (Part 2).** Forensic Science International 2008;182(1-3):52-56. [Editor's Notes: Presents the title study. 62 different seizures were analyzed using both extraction techniques, followed by GC/MS. The results emphasize the use of HS-SPME as an effective alternative to LLE, with advantages such as sample preparation and a solvent-free process. Contact: Ecole des Sciences Criminelles, Institut de Police Scientifique, University of Lausanne, Batochime, Lausanne-Dorigny CH-1015, Switz.]
3. El-Naby EH. **Polymeric membrane sensors for the selective determination of dextro-methorphan in pharmaceutical preparations.** Analytical Sciences 2008;24(11):1409-1414. [Editor's Notes: Presents the construction and electrochemical response characteristics of poly(vinyl chloride) matrix ion-selective electrodes for dextromethorphan hydrobromide. The LODs ranged from  $5.0 \times 10^{-5}$  -  $1.0 \times 10^{-3}$  M in pure and dosage forms by direct potentiometry and standard addition methods. Contact: Narcotic Department, National Center for Social and Criminal Research, Cairo 11561, Egypt.]
4. Gheorghe M, Balalau D, Ilie M, Baconi D-L, Ciobanu A-M. **Component analysis of illicit heroin samples by GC-MS method.** Farmacia (Bucharest, Romania) 2008;56(5):577-582. [Editor's Notes: Presents the title study. Contact: Criminalistics Research Institute of the Romanian Police General Inspectorate, Bucharest, Rom.]
5. Gheorghe M, Balalau D, Ilie M, Baconi DL, Ciobanu A-M. **Qualitative analysis of confiscated illegal drugs by thin-layer chromatography.** Farmacia (Bucharest, Romania) 2008;56(5):541-546. [Editor's Notes: Presents the title study. Contact: Criminalistics Research Institute of the Romanian Police General Inspectorate, Bucharest, Rom.]
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previously described for *Cannabis sativa* were multiplexed into one reaction. The reaction was able to individualize 98 cannabis samples (14 hemp and 84 marijuana, authenticated as originating from 33 of the 50 states in the U.S.) and detect 29 alleles averaging 4.8 alleles per loci. However, the data did not relate the samples from the same state to each other. Contact: Department of Chemistry and Biochemistry and International Forensic Research Institute, Florida International University, University Park, Miami, FL 33199.]

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primary precursors for methamphetamine samples seized during 2006-2007. The presence of 1,3-dimethyl-2-phenylnaphthalene and 1-benzyl-3-methylnaphthalene indicate that 6 seizures were synthesized via the hydriodic acid/red phosphorus method. Five new impurities were identified (not specified in the abstract). Contact: Forensic Medical Examination Center of Beijing Public Security Bureau, Beijing, Peop. Rep. China.]

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#### Additional References of Possible Interest:

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# Microgram

## *Bulletin*

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The U.S. Attorney General has determined that the publication of this periodical is necessary in the transaction of the public business required by the Department of Justice. Information, instructions, and disclaimers are published in the January issues.

**- MARCH 2009 -**

**- INTELLIGENCE ALERT -**

### **“SPICE” - PLANT MATERIAL(S) LACED WITH SYNTHETIC CANNABINOIDS OR CANNABINOID MIMICKING COMPOUNDS**

The Customs and Border Protection (CBP) - Chicago Laboratory (Illinois) recently received five small, re-sealable, bright foil packets containing dull olive-colored plant material(s), labelled as “Spice Gold,” “Spice Silver,” “Spice Diamond,” “Genie,” and “Yucatan Fire” incense (see Photo 1, right, and Photos 2 - 3, next page), all reputedly laced with various synthetic cannabinoids or synthetic cannabinoid mimicking compounds, notably “HU-210” [(6aR,10aR)-9-(hydroxymethyl)-6,6-dimethyl-3-(2-methyloctan-2-yl)-6a,7,10,10a-tetrahydrobenzo[c]chromen-1-ol); see Figure 1, next page]. The exhibits were selected from a shipment containing approximately 1,500 such packets that were detained by a CBP agricultural specialist at an express parcel service hub in Wilmington, Ohio. The items were not smuggled but were rather part of a formal entry. Standard marijuana analyses (microscopy) of the materials were negative. Analysis of extracts by



**Photo 1 - Packages are about 2 x 3 inches.**

GC/MS in the scan mode with split injection indicated only the presence of a large amount of vitamin E and other, smaller amounts of various natural products. However, when the extracts were derivatized with N,O-bis(trimethylsilyl)acetamide and injected splitless with selected ion monitoring, HU-210 was found in very small but verifiable amounts in every packet (not quantitated). The results were confirmed against a standard. These were the first such submissions to the laboratory.

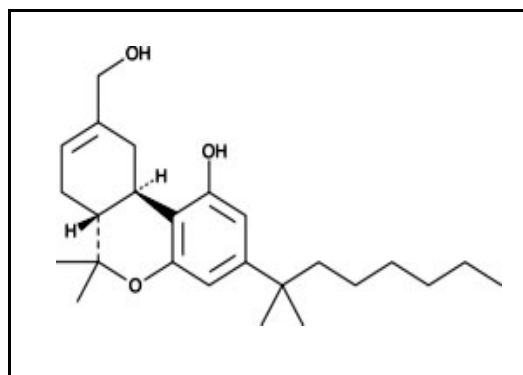


**Photo 2**



**Photo 3**

[Additional Laboratory and Editor's Notes: In addition to the above-named products, there are at least two other such herbal products: "Skunk," and "Sence." These products are currently being encountered nationwide. They, and the synthetic cannabinoids and cannabinoid mimic compounds they contain, are also the subjects of widespread discussion and speculation on the Internet. Based on anecdotal reports, HU-210 is hundreds of times more potent than THC; thus, the trace amounts detected in the above case are physiologically active, and these materials may be viewed as "stealth marijuana." The reference standard of HU-210 used in this case was purchased from Cayman Chemical of Ann Arbor, Michigan. The ions selected for the analysis were  $m/z$  446 (100%), 530 (molecular ion), 447, 474, and 356. Note that HU-210 is named in several different ways; for example: (6a*R*,10a*R*)-3-(1,1'-dimethylheptyl)-6a,7,10,10a-tetrahydro-1-hydroxy-6,6-dimethyl-6H-dibenzo[*b,d*]pyran-9-methanol. HU-210 is controlled (Schedule I) in the U.S. (See: [http://www.deadiversion.usdoj.gov/drugs\\_concern/spice/spice\\_hu210.htm](http://www.deadiversion.usdoj.gov/drugs_concern/spice/spice_hu210.htm)), and products containing it and similar cannabinoids are controlled within the U.S. and in a number of other countries, including Austria, Canada, Germany, the Netherlands, and Switzerland. In addition to HU-210, there are at least half a dozen other compounds with similar structures, plus several unrelated compounds that have cannabinoid mimicking effects (notably JWH-018 (1-pentyl-3-(1-naphthoyl)indole)), that are being used to adulterate the plant materials in "Spice" and similar products. An article presenting mass spectral data and background information on these compounds was recently published on line (not yet published in hard copy); see: Auwarter V, Dresen S, Weinmann W, Muller M, Putz M, Ferreiros N. "Spice" and other herbal blends: Harmless incense or cannabinoid designer drugs? *Journal of Mass Spectrometry* 2009.]

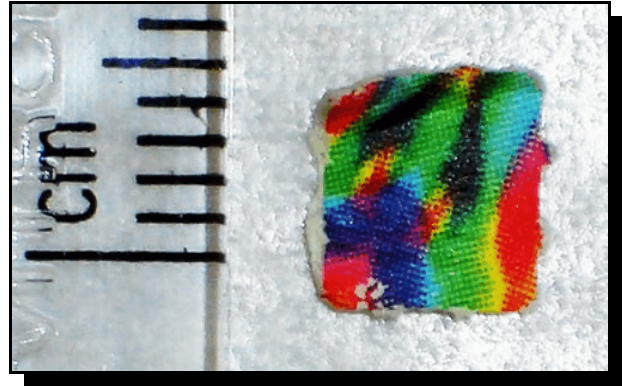


**Figure 1 - HU-210**

**- INTELLIGENCE ALERT -**

**BLOTTER ACID MIMIC (ACTUALLY CONTAINING A MIXTURE OF  
4-CHLORO-2,5-DIMETHOXYAMPHETAMINE AND 4-BROMO-  
2,5-DIMETHOXYAMPHETAMINE) IN WARNER ROBINS, GEORGIA**

The Georgia Bureau of Investigation - Central Regional Crime Laboratory (Macon) recently received one square of tie-dyed blotter paper, suspected LSD (see Photo 4). The exhibit was seized in Warner Robins (approximately 25 miles south of Macon) by personnel from the Houston County Sheriff's Office, pursuant to a domestic dispute call. Analysis of extracts by GC/MS and HPLC, however, indicated not LSD but rather a 2 : 1 mixture of 4-chloro-2,5-dimethoxyamphetamine (DOC) and 4-bromo-2,5-dimethoxyamphetamine (DOB) (not quantitated but a moderate loading based on the TIC). The Georgia Bureau of Investigation has previously seen blotter acid mimics that contained either DOC or DOB, but this is the first submission that contained a mixture of both compounds.



**Photo 4**

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**- INTELLIGENCE ALERT -**

**“LEMMON 714” QUAALUDE MIMIC TABLETS (ACTUALLY CONTAINING  
DIAZEPAM) IN DUPAGE COUNTY, ILLINOIS**

The DuPage County Crime Laboratory (Wheaton, Illinois) recently received one partial and five whole white, round tablets, 14 millimeters in diameter, with a “LEMMON 714” logo on one face and single-scored on the opposite face, apparent Quaaludes (see Photo 5). The exhibits were seized by a local agency investigating a drug overdose (details sensitive). Analysis of methanol and chloroform extracts of one tablet (mass 0.88 gram) by GC/MS, however, indicated not methaqualone but rather diazepam (not quantitated, but a high loading based on the TIC). This was the first ever submission of Quaalude mimic tablets to the laboratory.



**Photo 5**

[Editor's Note: An overview of similar diazepam-containing “LEMMON 714” Quaalude mimic tablets was presented in a recent issue; see: Microgram Bulletin 2007:40(1):5-6.]

**- INTELLIGENCE ALERT -**

**ECSTASY MIMIC TABLETS (ACTUALLY CONTAINING DIPHENHYDRAMINE OR DIPHENHYDRAMINE AND CAFFEINE) IN LAKE COUNTY, OHIO**

The Lake County Crime Laboratory (Painesville, Ohio) recently received a submission of eight round, blue tablets imprinted with a logo of two females back-to-back and four round, purple-speckled tablets imprinted with a logo of an automobile (see Photos 6 and 7), and a separate submission of another one of the blue tablets, all suspected Ecstasy. The first set of tablets were acquired in Lake County (approximately 40 miles east of Cleveland) by an unnamed police department (no further details). The single tablet was also seized in Lake County, but by a different police department (also unnamed), incidental to a traffic stop. Both sets of tablets were approximately 8 millimeters in diameter and 4 millimeters thick. Analysis of the blue tablets (approximately 300 milligrams each) by color testing, GC/MS, and FTIR, however, indicated not MDMA but rather diphenhydramine. Analysis of the purple-speckled tablets (approximately 365 milligrams each) by the same techniques indicated a 3 : 1 mixture of diphenhydramine and caffeine. In both cases, the loading of the diphenhydramine was fairly high (not formally quantitated). These are the first submissions of Ecstasy mimic tablets containing only diphenhydramine or a diphenhydramine/caffeine mixture to the laboratory.



**Photo 6**



**Photo 7**

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**- INTELLIGENCE ALERT -**

**ECSTASY MIMIC TABLETS (ACTUALLY CONTAINING A MIXTURE OF 1-(3-CHLOROPHENYL)PIPERAZINE AND CAFFEINE) IN ALLIANCE, OHIO**

The Canton-Stark County Crime Laboratory (Canton, Ohio) recently received two round tablets, one small and green and the other typically sized and blue, alleged “Triple Ecstasy” (purportedly an unusually potent form of Ecstasy; no photos). The exhibits were acquired in Alliance, Ohio (east of Canton) by an Alliance Police Department Special Investigative Unit (no further details). The green tablet was approximately 5 millimeters in diameter and 5 millimeters thick, weighed 170 milligrams, and had a 5-point star logo. The blue tablet was approximately 8 millimeters in diameter and 5 millimeters thick, weighed 270 milligrams, and had a deeply cut triangle logo. Analysis of both tablets by color testing (Marquis - negative), FTIR, and GC/MS, however, indicated not MDMA but rather a 3 : 2 mixture of 1-(3-chlorophenyl)piperazine (mCPP) and caffeine (not quantitated but a high loading based on the TIC). This is the first submission of Ecstasy mimic tablets containing mCPP, and also the first submission of a small Ecstasy mimic tablet, to the laboratory.



**- INTELLIGENCE ALERT -**

**OXYCONTIN MIMIC TABLETS (ACTUALLY CONTAINING A MIXTURE OF HEROIN, CAFFEINE, AND LACTOSE) IN SEATTLE, WASHINGTON**

The DEA Western Laboratory (San Francisco, California) recently received two round biconvex tablets, 9 millimeters in diameter, with “OC” imprinted on one face and “80” on the opposite face, apparent OxyContin (see Photos 8 and 9).

The exhibit was acquired in Seattle, Washington by personnel from the DEA Seattle Field Division (no further details). The tablets had a green coating over a compressed, light brown powder (actual OxyContin tablets have a lighter green coating over a compressed white powder). Analysis of the tablets (total net mass 0.56 grams) by GC/MS, GC/FID, FTIR/ATR, and <sup>1</sup>H-NMR, however, indicated not oxycodone but rather a mixture of heroin (11.6 milligrams/tablet), caffeine (not quantitated), and lactose. This is the first known submission of OxyContin mimic tablets containing heroin to the Western Laboratory.



**Photo 8**



**Photo 9**

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**- INTELLIGENCE ALERT -**

**ECSTASY COMBINATION TABLETS (CONTAINING MDMA, METHAMPHETAMINE, AND CAFFEINE) IN STAFFORD, VIRGINIA**

The DEA Mid-Atlantic Laboratory (Largo, Maryland) recently received one plastic bag containing a total of 236 round blue tablets imprinted with a fly logo on one face and an indiscernible logo on the opposite face (possibly a bear or a buffalo), and 262 round blue tablets imprinted on one face only with the indiscernible (bear/buffalo) logo, both approximately 8.5 millimeters in diameter, suspected Ecstasy (see Photo 10). The exhibits were acquired in Stafford, Virginia by personnel from the Bureau of Alcohol, Tobacco, Firearms, and Explosives. Analysis of the double imprint tablets (total net mass 77.8 grams) by GC/FID, GC/MS, and LC indicated 49.7 milligrams/tablet MDMA, 14.1 milligrams/tablet methamphetamine, and caffeine (not quantitated). Analysis of the single imprint tablets (total net mass 84.7 grams) by the same techniques indicated 46.9 milligrams/tablet MDMA, 12.6



**Photo 10**

milligrams/tablet methamphetamine, and caffeine (again not quantitated). These were the first submissions of Ecstasy combination tablets with these logos, and also the first submission of Ecstasy combination tablets with logos on both faces, to the Mid-Atlantic Laboratory.

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**- INTELLIGENCE ALERT -**

***L*-METHAMPHETAMINE IN HAMMOND, INDIANA AND CHICAGO, ILLINOIS**

The DEA North Central Laboratory (Chicago, Illinois) recently received two submissions, each containing five oblong packages of yellow, crystalline materials, suspected methamphetamine (no photos). The first set was seized by DEA Chicago Field Division personnel from an impounded vehicle in Hammond, Indiana, while the second set was seized by DEA Chicago Field Division personnel pursuant to a warrant search in Chicago (no further details). All ten packages were successively wrapped in layers of clear plastic, baby wipes, and black electrical tape. Analysis of the crystalline material (total net mass 4.3 kilograms) by GC/FID, GC/MS, and IR indicated 95 - 99 % methamphetamine hydrochloride. Additional analysis following derivatization with N-trifluoroacetyl-L-prolyl chloride by GC/FID and GC/MS, however, indicated not *d*-methamphetamine but rather *l*-methamphetamine (isomer purity not determined, but high). The North Central Laboratory has received several submissions of *l*-methamphetamine; however, these are the first large submissions of *l*-methamphetamine in recent years.

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**- INTELLIGENCE ALERT -**

**CAPTAGON MIMIC TABLETS (CONTAINING *d,l*-AMPHETAMINE,  
CAFFEINE, THEOPHYLLINE, AND OTHER COMPONENTS)  
IN AL ANBAR PROVINCE, IRAQ**

The DEA Special Testing and Research Laboratory (Dulles, Virginia) recently received two separate submissions containing a combined total of 9,382 round tablets of four different colors, all biconvex and imprinted with a Captagon-like logo on one face and a single score on the reverse side, apparent Captagon (fenethylline; no photos). The exhibits were seized in Al Anbar Province, Iraq by U.S. Department of Defense personnel (no further details). The first exhibit contained 4,860 white tablets (8.1 x 3.4 millimeters, total net mass 871 grams), all contained in a package illustrated with an ad for a Toyota SUV and containing a small packet of silica beads (as a desiccant). Analysis by color testing (Marquis, silver nitrate, and barium chloride), GC/FID, GC/MS, FTIR, NMR, and CE, however, indicated not fenethylline but rather *d,l*-amphetamine (20 milligrams/tablet), caffeine (39 milligrams/tablet), theophylline (14 milligrams/tablet), acetaminophen (11 milligrams/tablet), and lactose. The second exhibit contained 3 different color tablets, all contained in a package illustrated with an ad for a Mercedes-Benz SUV and again containing a small packet of silica beads. The first sub-exhibit contained 980 off-white tablets (8.2 x 3.1 millimeters, total net mass 160 grams). Analysis (same techniques) indicated *d,l*-amphetamine (7 milligrams/tablet), caffeine (65



milligrams/tablet), theophylline (8 milligrams/tablet), acetaminophen (9 milligrams/tablet), and lactose. The second sub-exhibit contained 2,655 tan tablets (8.3 x 3.7 millimeters, total net mass 469 grams). Analysis (same techniques) indicated *d,l*-amphetamine (10 milligrams/tablet), caffeine (30 milligrams/tablet), theophylline (39 milligrams/tablet), acetaminophen (21 milligrams/tablet), diphenhydramine (2.1 milligrams/tablet), quinine (2.1 milligrams/tablet), and lactose. The third sub-exhibit contained 887 dark brown tablets (8.3 x 3.4 millimeters, total net mass 156 grams). Analysis (same techniques) indicated *d,l*-amphetamine (10 milligrams/tablet), caffeine (30 milligrams/tablet), theophylline (38 milligrams/tablet), acetaminophen (21 milligrams/tablet), diphenhydramine (2.1 milligrams/tablet), quinine (2.1 milligrams/tablet), and lactose. In each case, the amphetamine was calculated as the sulfate, while the diphenhydramine and quinine were calculated as the hydrochlorides. All exhibits also contained varying amounts of N-formylamphetamine (not quantitated), probably present as a contaminant from a poorly executed Leuckart synthesis of amphetamine. The Special Testing and Research Laboratory has previously received Captagon mimic and counterfeit tablets, but none with these compositions.

[Editor's Notes: Fenethylline is a controlled substance in the U.S. (Schedule I). It is a CNS stimulant.]

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## SELECTED REFERENCES

[The Selected References section is a compilation of recent publications of presumed interest to forensic chemists. Unless otherwise stated, all listed citations are published in English. Abbreviated mailing address information duplicates that provided by the abstracting service. Patents and Proceedings are reported only by their *Chemical Abstracts* citation number.]

1. Boudreau DK, Casale JF. **An in-depth study of the Peruvian Base Llavada ("Washed Base") technique for purification of crude cocaine base.** Microgram Journal 2008;6(3-4):72-81. [Editor's Notes: Presents an in-depth study of the title technique, which is being used as a substitute method for the traditional potassium permanganate process. The fate of several alkaloid impurities is tracked. Contact: U.S. Department of Justice, Drug Enforcement Administration, Special Testing and Research Laboratory, 22624 Dulles Summit Court, Dulles, VA 20166.]
2. Casale JF, Corbeil EM, Hays PA. **Identification of levamisole impurities found in illicit cocaine exhibits.** Microgram Journal 2008;6(3-4):82-89. [Editor's Notes: 6-Phenyl-2,3-dihydroimidazo[2,1b]thiazole and 3-(2-mercaptoethyl)-5-phenylimidazole-2-one, known levamisole degradation products, were identified in a "crack" cocaine exhibit. Spectroscopic and chromatographic data are provided. Contact: U.S. Department of Justice, Drug Enforcement Administration, Special Testing and Research Laboratory, 22624 Dulles Summit Court, Dulles, VA 20166.]
3. Casale JF, Orlando PM, Colley VL, Hays PA. **Identification of diltiazem impurities / artifacts during the analyses of illicit cocaine exhibits containing diltiazem.** Microgram Journal 2008;6(3-4):90-103. [Editor's Notes: Desacetyldiltiazem and an uncharacterized artifactual compound with an apparent mass of 354 Daltons have been observed in the GC profiles of cocaine exhibits containing diltiazem. The use of methanol as an injection solvent for samples containing sodium bicarbonate causes the formation of these compounds in the injection port. Spectroscopic and chromatographic data are provided for diltiazem, desacetyldiltiazem, and

2,3-dehydrodesacetyldiltiazem. Contact: U.S. Department of Justice, Drug Enforcement Administration, Special Testing and Research Laboratory, 22624 Dulles Summit Court, Dulles, VA 20166.]

4. Corbeil EM, Casale JF. **Determination of cocaine in various South American commercial coca products.** Microgram Journal 2008;6(3-4):109-113. [Editor's Notes: Cocaine content is provided for several coca products, including coca tea, medicinal tonics and rubs, and alcoholic liquors. The cocaine was separated from the complex matrices utilizing trap column chromatography. GC/MS/SIM was used for identification and quantitation. The cocaine in these products ranged from 0.00 - 0.65 µg/mg. Contact: U.S. Department of Justice, Drug Enforcement Administration, Special Testing and Research Laboratory, 22624 Dulles Summit Court, Dulles, VA 20166.]
5. Daundkar BB, Malve MK, Krishnamurthy R. **A specific chromogenic reagent for detection of diazepam among other benzodiazepines from biological and nonbiological samples after HPTLC.** Journal of Planar Chromatography - Modern TLC 2008;21(4):249-250. [Editor's Notes: Focus is on biological matrices, but also included diazepam standard and diazepam-containing tablets. Developed plates were sprayed with 5% NaOH followed by 1% meta-dinitrobenzene in DMSO. Violet bands were obtained for diazepam; other benzodiazepines (e.g., oxazepam, nitrazepam, lorazepam, chlordiazepoxide, and flurazepam) did not react. The LOD is approximately 5 m g. Contact: Home Dept., State of Maharashtra, Forensic Science Laboratories, Mumbai 400098, India.]
6. Gerlits J. **An Excel based molecular weight calculator.** Journal of the Clandestine Laboratory Investigating Chemists Association 2009;19(1):2-3. [Editor's Notes: Presents the title program. JCLICA is a law enforcement restricted journal. Contact: Utah Bureau of Forensic Services, Southern Utah Crime Laboratory, SUU Technology Bldg 109, 351 W Center St, Cedar City, Utah 84720.]
7. Jones LM, Boudreau DK, Casale JF. **"Crack" cocaine: A study of stability over time and temperature.** Microgram Journal 2008;6(3-4):114-127. [Editor's Notes: Changes in the appearance, weights, purity levels, and alkaloidal profiles of 146 laboratory-prepared "crack" cocaine exhibits stored under different temperatures and packaging types, were studied over a one year period. An accelerated aging study (elevated temperature, one month) was also performed with 2 "crack" cocaine exhibits, to simulate very long-term or higher temperature storage. The results are presented and discussed. Contact: U.S. Department of Justice, Drug Enforcement Administration, Special Testing and Research Laboratory, 22624 Dulles Summit Court, Dulles, VA 20166.]
8. McGehee MC. **Etodolac: An analytical profile.** Microgram Journal 2008;6(3-4):104-108. [Editor's Notes: Etodolac (Lodine) has been identified in various submissions of illicit heroin. Analytical data, including GC, IR, Raman, MS, and <sup>1</sup>H-NMR, are presented. Contact: U.S. Department of Justice, Drug Enforcement Administration, Northeast Laboratory, 99 10th Avenue, Suite 721, New York, NY 10011.]
9. Moore JM, Casale JF. **The discoloration of illicit drug samples.** Microgram Journal 2008;6(3-4):128-145. [Editor's Notes: Presents an in-depth study of the browning of cocaine samples over time. The discolored samples were all found to contain a primary aromatic amine (either procaine or benzocaine), a sugar (either lactose or dextrose), and an acid (such as cocaine hydrochloride, boric acid, benzoic acid, etc.) The rate of discoloration of the drug mixtures was both pH and temperature dependant, i.e., the rate of sample browning increased with lower pH and/or higher temperature. All discolored samples that contained procaine or benzocaine also

- contained N-formylprocaine or N-formylbenzocaine, respectively, and these are therefore *bona fide* “marker” compounds for the browning of illicit cocaine. Contact: U.S. Department of Justice, Drug Enforcement Administration, Special Testing and Research Laboratory, 22624 Dulles Summit Court, Dulles, VA 20166.]
10. Ogata J, Kikura-Hanajiri R, Yoshimatsu K, Kiuchi F, Goda Y. **Detection method for the ability of hemp (*Cannabis sativa* L.) seed germination by the use of 2,3,5-triphenyl-2H-tetrazolium chloride (TTC).** Yakugaku Zasshi 2008;128(11):1707-1711. [Editor’s Notes: A rapid detection method to assess the ability of Cannabis seeds to germinate is presented. The respiratory enzymes in viable seeds convert colorless 2,3,5-triphenyl-2H-tetrazolium chloride into red 1,3,5-triphenylformazan (dead seeds remain colorless). Under optimum conditions, the viability of seeds could be determined within 20 minutes. Contact: National Institute of Health Sciences, 1-18-1 Kamiyoga, Setagaya-ku, Tokyo, Japan 158-8501.]
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  12. Person EC, Sunderson NS. **Liquid - liquid extraction of phenylephrine.** Journal of the Clandestine Laboratory Investigating Chemists Association 2009;19(1):4-7. [Editor’s Notes: Presents techniques for more efficient extraction of phenylephrine (the compound substituted for pseudoephedrine in many cold and allergy medications). *JCLICA* is a law enforcement restricted journal. Contact: California State University - Fresno, 2555 E. San Ramon Ave. SB70, Fresno, CA 93740.]
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# Microgram

## *Bulletin*

**Published by:**

The Drug Enforcement Administration  
Office of Forensic Sciences  
Washington, DC 20537

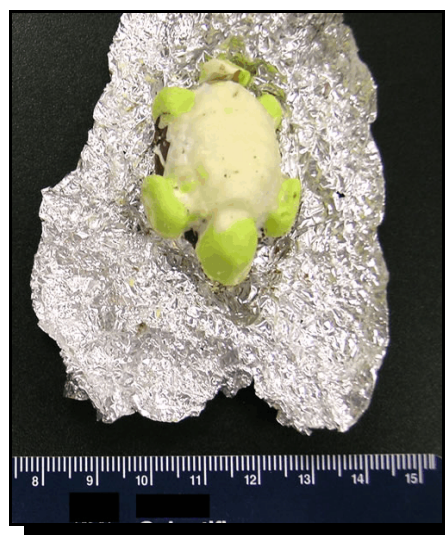
The U.S. Attorney General has determined that the publication of this periodical is necessary in the transaction of the public business required by the Department of Justice. Information, instructions, and disclaimers are published in the January issues.

- APRIL 2009 -

**- INTELLIGENCE ALERT -**

**MDMA IN TURTLE-SHAPED CHOCOLATES AND IN *PSILOCYBE*  
MUSHROOMS NEAR PORTLAND, OREGON**

The Oregon State Police Portland Metro Forensic Laboratory (Clackamas) recently received two turtle-shaped chocolates wrapped in aluminum foil, suspected to contain MDMA (see Photo 1). The exhibit, along with marijuana, psilocin mushrooms, and LSD, was seized by the Lake Oswego Police Department in Lake Oswego, Oregon, incident to a traffic stop. The chocolates had a brown center portion and a white/green candy coating (see Photo 2). Analysis of the chocolates (total net mass 14.8 grams) by UV and GC/MS indicated MDMA (not quantitated, but a moderate loading based on the TIC) in the center portion. Analysis of the psilocin mushrooms also indicated MDMA at significant levels (based on the TIC). No visible powder was present, suggesting that the mushrooms were infused with a liquid containing MDMA. This is the first submission of chocolates containing MDMA to the state's laboratory system.



**Photo 1**



**Photo 2**

\* \* \* \* \*

**- INTELLIGENCE ALERT -**

**COCAINE SMUGGLED IN FALSE-BOTTOM BOXES  
AT MIAMI INTERNATIONAL AIRPORT**

The Virginia Department of Forensic Science, Eastern Laboratory (Norfolk) recently received two partially disassembled shipping boxes with reinforced bottoms, both containing a chunky material, suspected cocaine (see Photos 3 and 4). The exhibit was seized by Immigration and Customs Enforcement personnel at the Miami International Airport. Unusually, the material was concealed between layers of cardboard with no other packaging or wrapping. The packages were being shipped from Jamaica to addresses in Chesapeake and Portsmouth, Virginia, but were intercepted and later seized following a controlled delivery. Analysis of the material (total net mass 323 grams) by GC/MS and FTIR confirmed cocaine hydrochloride, caffeine, and levamisole (not quantitated, but a high loading of cocaine based on the TIC). This was the first seizure of cocaine smuggled in this manner submitted to the laboratory.



**Photo 3**



**Photo 4**



**- INTELLIGENCE ALERT -**

**LARGE SEIZURE OF OPIUM IN ALPHARETTA, GEORGIA**

The Georgia Bureau of Investigation Headquarters Laboratory (Atlanta) recently received two large, taped packages, each containing a gummy, black substance approximately ½ inch thick, suspected opium (see Photo 5). The exhibits were being smuggled inside false-bottom boxes through commercial shipping companies from India to a location in Alpharetta (approximately 20 miles north of Atlanta). Analysis of the packages (total net mass 1950 grams) by GC/MS, TLC, and HPLC indicated morphine and codeine (not quantitated). This is the largest seizure of opium submitted to the laboratory in recent years.



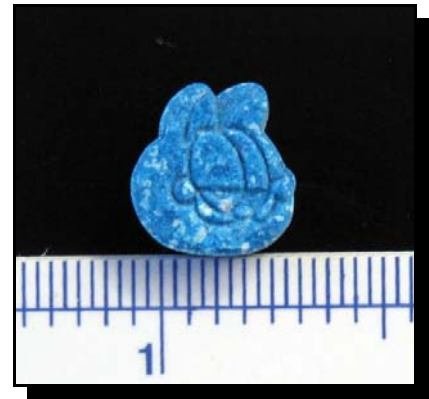
**Photo 5**

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**- INTELLIGENCE ALERT -**

**ECSTASY COMBINATION TABLETS (CONTAINING MDMA AND METHAMPHETAMINE) IN HALTOM CITY AND FORT WORTH, TEXAS**

The Tarrant County Medical Examiner's Office Laboratory (Fort Worth, Texas) recently received 20 blue Garfield face-shaped tablets, suspected Ecstasy (see Photo 6). The tablets were acquired by the Tarrant County Narcotics Unit in Haltom City (details sensitive; Haltom City is a suburb of Fort Worth). Analysis of the tablets (total net mass 5.9 grams) by GC/MS indicated an approximate 3:1 mixture of MDMA and methamphetamine, adulterated with caffeine (MDMA and methamphetamine not quantitated, but a moderate loading based on the TIC). This was the first submission of these shaped tablets to the laboratory.



**Photo 6**

\* \* \* \* \*

**- INTELLIGENCE ALERT -**

**ECSTASY AND ECSTASY COMBINATION TABLETS (CONTAINING MDMA, METHAMPHETAMINE, AND COCAINE) IN MEDFORD, OREGON**

The Oregon State Police Central Point Forensic Laboratory recently received 15 round tablets, suspected Ecstasy (not shown). The tablets were seized in Medford by the Medford Police Department (details sensitive). The tablets consisted of one red tablet with an indistinguishable imprint (total net mass 0.2 gram), five blue tablets with a Transformers head imprint (total net

mass 1.1 grams), and nine yellow tablets with a Transformers head imprint (total net mass 2.1 grams). Analysis by color testing and GC/MS indicated MDMA, methamphetamine, and cocaine for the red tablet (not quantitated) and MDMA for the blue and yellow tablets (not quantitated). This was the first submission of these type tablets to the laboratory. In addition, this was the first time that a tablet containing MDMA, methamphetamine, and cocaine was seen in one of the Oregon State Police laboratories.

\* \* \* \* \*

### **- INTELLIGENCE ALERT -**

#### **FRESH KHAT IN NEW CENTURY, KANSAS**

The Johnson County Crime Laboratory (Mission, Kansas) recently received two boxes containing 133 bundles of red/green vegetation each wrapped in leaves, as well as a small amount of dried vegetation, suspected khat (see Photo 7). The exhibit was seized by personnel from the Johnson County Sheriff's Office, incident to a traffic stop on Interstate 35. Analysis of the plant material (total gross mass 12.7 kilograms) by GC/MS indicated cathinone (not quantitated, but a moderate loading based on the TIC) and cathine (not confirmed). This was the largest submission of khat to the laboratory and the first seen in several years.



**Photo 7**

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### **- INTELLIGENCE ALERT -**

#### **BLOTTER ACID MIMIC (ACTUALLY CONTAINING 4-BROMO-2,5-DIMETHOXY-AMPHETAMINE (DOB) AND 4-CHLORO-2,5-DIMETHOXY-AMPHETAMINE (DOC)) IN PRATT COUNTY, KANSAS**

The Kansas Bureau of Investigation, West Region Laboratory (Great Bend, Kansas) recently received two squares of blotter paper with a Yoda design, suspected LSD (see Photo 8). The exhibit was seized by the Pratt Police Department in Pratt County (south central region of Kansas) incident to a traffic stop. Analysis by GC/MS indicated 4-bromo-2,5-dimethoxy-amphetamine (DOB) and 4-chloro-2,5-dimethoxy-amphetamine (DOC) in a 2:1 mixture based on the area counts. Although not quantitated, there was a moderate loading of DOB/DOC based on the TIC. This was the first submission of blotter paper containing a mixture of DOB/DOC to the laboratory.



**Photo 8**

**- INTELLIGENCE ALERT -**

**ECSTASY COMBINATION TABLETS (CONTAINING MDMA, CAFFEINE, PROCAINE, BZP, AND 1-(3,4-METHYLENEDIOXY-PHENYL)-2-PROPANOL) IN GRAND CAYMAN (CAYMAN ISLANDS)**

The Cayman Islands Forensic Science Laboratory (Grand Cayman) recently received a polydrug submission that included two mottled orange tablets, which were marked with a raised Adidas logo on one side and unmarked on the reverse (see Photo 9). The exhibit was seized by Royal Cayman Islands Police personnel in Grand Cayman. The tablets were 8.25 millimeters in diameter and 4.39 millimeters thick. Analysis of the orange tablets (approximately 244 milligrams each) by color test, GC/MS, and FTIR/ATR indicated MDMA, caffeine, procaine, N-benzylpiperazine (BZP, not confirmed) and 1-(3,4-methylenedioxyphenyl)-2-propanol (not confirmed); not quantitated but present in an approximate 28:1:69:1:1 ratio based on the TIC. This is the first submission of this mixture of drugs to the laboratory. The submission also included a folded piece of paper that contained yellow and green powder in two distinct layers. The two powders both contained BZP, 1-(3-(trifluoromethyl)phenyl)piperazine (TFMPP), 1,4-dibenzylpiperazine (not confirmed) and caffeine. The laboratory reported one unrelated follow-up submission of the same type tablet pictured above.



**Photo 9**

\* \* \* \* \*

**- INTELLIGENCE ALERT -**

**CAPSULES CONTAINING 17-METHYLTESTOSTERONE IN SEABROOK, TEXAS**

The Pasadena Regional Crime Lab (Texas) recently received 21 red and white capsules with an imprint of "Swiss" (see Photo 10). The capsules (total net mass 10.3 grams) were seized in Seabrook by the Seabrook Police Department along with seven other exhibits from a possession of marijuana charge (no further details). Analysis of the capsules by GC/MS, UV, FTIR, and Sulfuric Acid test indicated 17-methyltestosterone and lactose. Although not quantitated, the capsules had a moderately heavy loading of 17-methyltestosterone based on the TIC. This is the laboratory's first encounter with a steroid in this type of dosage form.



**Photo 10**  
(Scale is inches)



**- INTELLIGENCE ALERT -**

**HEROIN CONCEALED AS SOLES IN SHOES NEAR EATON, OHIO**

The Ohio State Highway Patrol Crime Laboratory (Columbus) recently received four wrapped packages of compressed white powder, suspected heroin (see Photo 11). The evidence was seized by the Ohio State Highway Patrol Canine Handlers (Piqua District Headquarters) incident to a traffic stop near Eaton, Ohio. The evidence was concealed in two pairs of shoes with the soles hollowed out. One pair of shoes was on the suspect's feet and the other pair, labeled with cartoon images of the Marvel character Spider Man, was found in the vehicle. The four packages were wrapped in layers of plastic, tape, carbon paper, and material with the odor of chili powder. Analysis of the white powder (total net mass 2,327 grams) by Marquis, UV/VIS, FTIR, and GC/MS indicated heroin (not quantitated, but a moderate to high loading based on the TIC). This is the laboratory's first submission of heroin smuggled in this manner in recent memory.



**Photo 11**

\* \* \* \* \*

**- INTELLIGENCE ALERT -**

**HEROIN BARS IN CANDY WRAPPERS AT MIAMI INTERNATIONAL AIRPORT**

The DEA Southeast Laboratory (Miami, Florida) recently received 34 chocolate-covered bars of compressed tan powder disguised as Jumbo Mani Chocolates (see Photo 12; legitimate Jumbo bars are a Colombian-produced candy). The exhibit was seized by personnel from the Immigration and Customs Enforcement and the Drug Enforcement Administration from the luggage of a passenger arriving at the Miami International Airport from Colombia. The powder was compressed in square units (as typical with most chocolate bars), covered with brown plastic, and coated with a thin layer of chocolate. Analysis of the powder (total net mass 1807 grams) by FTIR, GC/FID, and GC/MS indicated heroin hydrochloride (94%, a higher purity than a typical heroin submission to the Southeast Laboratory). This is the first submission of "candy bars" with these wrappers to the laboratory.

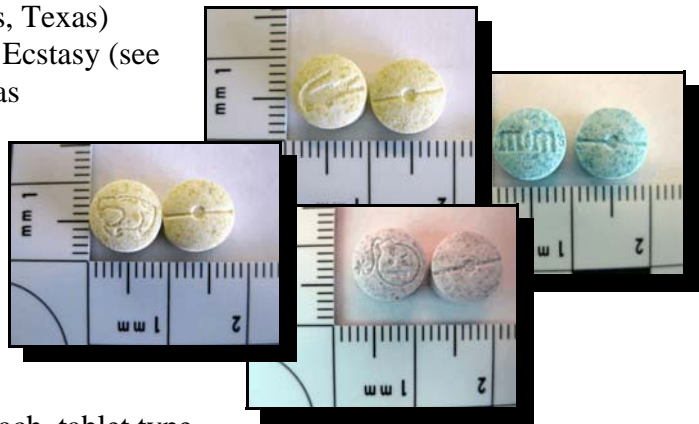


**Photo 12**

**- INTELLIGENCE ALERT -**

**ECSTASY COMBINATION TABLETS (CONTAINING MDMA, KETAMINE,  
AND CAFFEINE) IN AMARILLO, TEXAS**

The DEA South Central Laboratory (Dallas, Texas) recently received 37,954 tablets, suspected Ecstasy (see Photo 13). The tablets were seized by Texas Department of Public Safety personnel incident to a routine traffic stop in Amarillo. The exhibit was comprised of four different types of tablets/imprints: blue tablets with an “m&m’s” imprint, yellow tablets with an alligator imprint, yellow tablets with a “Thundercat” imprint, and purple tablets with a bomb imprint. Analysis of the tablets indicated each tablet type contained 86.1 - 95.3 milligrams/tablet of 3,4-methylenedioxymethamphetamine hydrochloride (MDMA), ketamine (<5%), and caffeine (not quantitated). MDMA tablet submissions to the South Central Laboratory in recent years have primarily contained low-level amounts of MDMA with mixtures of methamphetamine and/or other controlled substances.



**Photo 13**

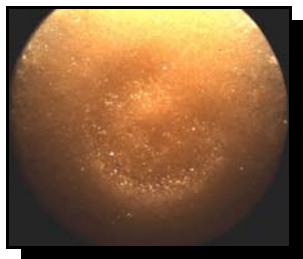
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**- INTELLIGENCE ALERT -**

**ECSTASY MIMIC TABLETS (ACTUALLY CONTAINING METHAMPHETAMINE  
AND DIMETHYLSULFONE) IN NEW JERSEY**

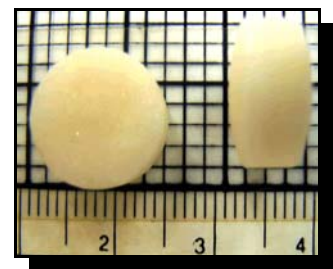
The DEA Northeast Laboratory (New York, New York) recently received 1,000 off-white, yellowish colored tablets with a light "G" imprint on one side, suspected 3,4-methylenedioxymethamphetamine (see Photos 14 and 15). The tablets were seized by the Federal Bureau of Investigation, New Jersey Field Office (no further details). Analysis of the tablets (total net mass 829 grams) by color test, GC/FID, GC/MS, FTIR/ATR, and capillary electrophoresis indicated 20.6

milligrams/tablet of methamphetamine, adulterated with dimethylsulfone, caffeine, and procaine hydrochloride (not quantitated). The laboratory routinely analyzes tablets and powders containing methamphetamine. This was an unusual submission due to the high concentration of dimethylsulfone (not quantitated) compared to that of methamphetamine (2.7 %).



**Photo 15**

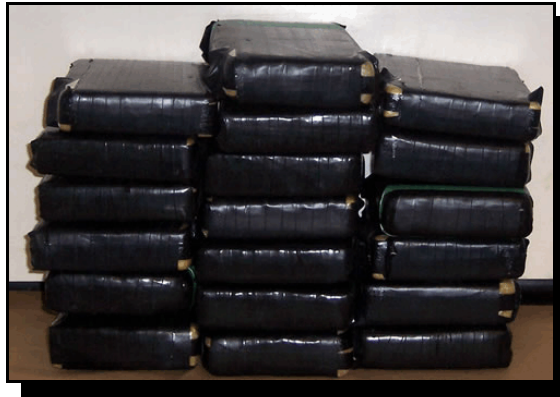
(Close-up of imprint)



**Photo 14**

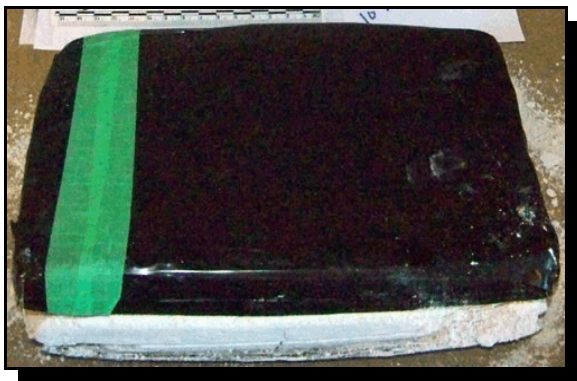
**- INTELLIGENCE ALERT -**

**HEROIN BRICKS INCLUDED IN A SHIPMENT OF COCAINE BRICKS  
AT THE CALEXICO PORT OF ENTRY, CALIFORNIA**



**Photo 16**

The DEA Southwest Laboratory (Vista, California) received 19 kilo bricks of off-white, compressed powder, suspected cocaine (see Photo 16). The exhibit was seized by personnel from Immigration and Customs Enforcement at the Calexico Port of Entry from a Toyota Camry attempting to enter the US. All of the packages had a similar appearance, initially: rectangular-shaped packages with an outer wrapping of black electrical tape. The packages were further wrapped in clear plastic, wax, yellow grease, tan tape, and a plastic bag. Four bricks also had a piece of green tape on one side of the package. The contents of these four bricks were less compact and were darker than the rest (see Photos 17 and 18). Analysis by Marquis, non-acidified cobalt thiocyanate, IR, HPLC, and GC indicated that the four packages with green tape (total net mass 3,994 grams) were not cocaine, but rather 93.1% heroin hydrochloride. The remaining fifteen packages (total net mass 14.87 kilograms) contained 62.8 % cocaine hydrochloride adulterated with levamisole and mannitol. Heroin bricks are not commonly encountered at the Southwest Laboratory.



**Photo 17**  
Heroin “brick”



**Photo 18**  
Cocaine  
(More compact, lighter)



## SELECTED REFERENCES

[The Selected References section is a compilation of recent publications of presumed interest to forensic chemists. Unless otherwise stated, all listed citations are published in English. Abbreviated mailing address information duplicates that provided by the abstracting service. Patents and Proceedings are reported only by their *Chemical Abstracts* citation number.]

1. Archer RP. **Fluoromethcathinone, a new substance of abuse.** Forensic Science International 2009;185(1-3):10-20. [Editor's Note: 3'-fluoromethcathinone has been identified in capsules marketed as plant feeders available from internet suppliers. It is apparent from internet forums that these so-called plant feeders are being used as recreational drugs. Contact: Kingston University, Penrhyn Road, Kingston Upon Thames, Surrey KT1 2EE, UK.]
2. Awad T, Belal T, Clark CR, De Ruiter J, Kramer K. **Comparison of GC-MS and GC-IRD methods for the differentiation of methamphetamine and regioisomeric substances.** Forensic Science International 2009;185(1-3):67-77. [Editor's Notes: A review of the title technique. Contact: Department of Pharmacal Sciences, Harrison School of Pharmacy, Auburn University, Auburn, AL 36849.]
3. Awad T, DeRuiter J, Clark CR. **GC-MS analysis of acylated derivatives of a series of side chain regioisomers of 2-methoxy-4-methylphenethylamines.** Journal of Chromatographic Science 2008;46(5):375-380. [Editor's Notes: A review of the title technique. Contact: Department of Pharmacal Sciences, School of Pharmacy, Auburn University, Auburn, AL 36849.]
4. Azimova ID, Arzamastsev AP, Dolbnev DV, Dorofeev VL, Stepanova EV, Vakhtel AV. **Use of near-infrared spectrophotometry (NIR) for identification of pharmaceutical drugs.** Voprosy Biologicheskoi, Meditsinskoi i Farmatsevticheskoi Khimii 2008;(6):27-30. [Editor's Notes: The study of generic drugs based on Omeprazol was conducted in three groups called "the name," "the manufacturer," and "the counterfeit product" using the IR-Furie Bruker multipurpose analyzer. This method has a strong potential for drug identification and brings the new possibilities into drug quality control system. Contact: Mosk. Med. Akad. im. I. M. Sechenova, Moscow, Russia.]
5. Borges F, Cordeiro M, Mosquera RA, Natalia DS, Rincon DA. **Theoretical study of cocaine and ecgonine methyl ester in gas phase and in aqueous solution.** Chemical Physics Letters 2009;467(4-6):249-254. [Editor's Notes: Explains why ecgonine methyl ester is the principal metabolite of cocaine in a human environment. Contact: REQUIMTE, Departamento de Quimica, Universidade do Porto, Oporto, Port. 4169-007.]
6. Cooks RG, Ifa DR, Jackson AU, Paglia G. **Forensic applications of ambient ionization mass spectrometry.** Analytical and Bioanalytical Chemistry 2009, (no pages given). [Editor's Notes: Several ambient ionization methods utilize different mechanisms to create ions for mass-spectrometric analysis. Forensic applications of these techniques for the analysis of toxic industrial compounds, chemical warfare agents, illicit drugs and formulations, explosives, foodstuff, inks, fingerprints, and skin are reviewed. Contact: Department of Chemistry, Purdue University, West Lafayette, IN.]
7. Hancock WS, Jiang H, Karger BL, Wu SL. **Mass spectrometric analysis of innovator, counterfeit, and follow-on recombinant human growth hormone.** Biotechnology Progress

- 2009;25(1):207-218. [Editor's Notes: A detailed characterization of recombinant human growth hormone using various analytical instruments (e.g., LC-MS, MS/MS) The extent of oxidation, deamidation, and chain cleavages were measured. The subtle but distinct differences were found in the recombinant human growth hormone from the three manufacturers (the follow-on, counterfeit, and the original innovator products). These differences are likely because of nonidentical manufacturing, formulation procedures, and storage conditions. Contact: Barnett Institute and Dept. of Chemistry and Chemical Biology, Northeastern University, Boston, MA 02115.]
8. Janowska E. **Peruvian foodstuffs with cocaine.** *Z Zagadnien Nauk Sadowych* 2008;75: 276-281. [Editor's Notes: Various foodstuffs seized from an individual entering a polish airport from Peru were analyzed by HPLC and found to contain cocaine and benzoylecgonine; quantitative results were given. Contact: Institute of Forensic Research, Krakow, Poland.]
  9. Liao Y, Liu H, Liu K, Yan B, Zhang Z. **CE-MS analysis of heroin and its basic impurities using a charged polymer-protected gold nanoparticle-coated capillary electrophoresis.** 2009;30(2):379-387. [Editor's Notes: The CE-MS method presented provides an alternative to LC-MS and GC-MS for illicit drug analysis. Contact: Beijing National Laboratory for Molecular Sciences, Key Laboratory of Bioorganic Chemistry and Molecular Engineering of Ministry of Education, Institute of Analytical Chemistry, College of Chemistry and Molecular Engineering, Peking University, Beijing, Peoples Republic of China.]

#### **Additional References of Possible Interest:**

1. Allison J. **Mass spectrometry theatre: A model for big-screen instrumental analysis.** *Journal of Chemical Education* 2008;85(11):1582-1583. [Editor's Notes: Discussion of an approach taken using the Mass Spectrometry Theater for conducting GC-MS training. Rather than a small group of students around a computer screen, a large group can work together with a large-screen version of the data system. The entire class can participate in the use of a single instrument. Contact: Department of Chemistry, College of New Jersey, Ewing, NJ 08628.]
2. Amisar S. **A reagent, a kit, and a method for detecting and identifying a wide range of illicit drugs.** (Patent, Mistral Detection Ltd., Israel). [Editor's Notes: A color reagent, two product testing kits, and a method for detecting and identifying controlled substances are discussed.]
3. Baker PE, Ferguson K, Jacobs R, Palmer PT, Webber S. **Use of field-portable XRF analyzers for rapid screening of toxic elements in FDA-regulated products.** *Journal of Agricultural and Food Chemistry* 2009;57(7):2605-2613. [Editor's Notes: A review of the title technique. Contact: Department of Chemistry and Biochemistry, San Francisco State University, San Francisco, CA 94132.]
4. Holden C. **Forensic Science Needs a Major Overhaul, Panel Says.** *Science* 2009;323(5918):1155.
5. Jiang G, Stenzel JR. **Identification of psychotropic substances in mushrooms by UHPLC/MS.** *LCGC North America* 2009;(Suppl.)13. [Contact: Crime Laboratory Division, Washington State Patrol, USA]
6. Nagashima M, Seto T, Suzuki J, Takahashi M, Yasuda I, Yoshida T. **Creation and application**

of psychoactive designer drugs data library using liquid chromatography with photodiode array spectrophotometry detector and gas chromatography-mass spectrometry. *Talanta* 2009;77(4):1245-1272. [Contact: Tokyo Metropolitan Institute of Public Health, 3-24-1 Hyakunin-cho, Shinjyuku-ku, Tokyo, Japan 169-0073.]

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## THE JOURNAL/TEXTBOOK COLLECTION EXCHANGE

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2004: March (# 2), July (# 4), November (# 6)  
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The next offering of journals and textbooks will be in the July 2009 issue of *Microgram Bulletin*.

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## THE DEA FY 2009 STATE AND LOCAL FORENSIC CHEMISTS SEMINAR SCHEDULE

The remaining FY 2009 schedule for the State and Local Forensic Chemists Seminar is as follows:

September 14-18, 2009

The school is open only to forensic chemists working for law enforcement agencies. It is intended for chemists who have completed their agency's internal training program and have also been working on the bench for at least one year. There is no tuition charge. The course is held at the Hyatt Place Dulles North Hotel in Sterling, Virginia (near the Washington/Dulles International Airport). A copy of the application form is reproduced on the last page of the August 2004 issue of *Microgram Bulletin* (see: <http://www.dea.gov/programs/forensicsci/microgram/mg0804/aug04.pdf>). Completed applications should be mailed to the Special Testing and Research Laboratory (Attention: J. Head) at: 22624 Dulles Summit Court, Dulles, VA 20166. For additional information, call 703/668-3349.

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# Microgram

## *Bulletin*

**Published by:**

The Drug Enforcement Administration  
Office of Forensic Sciences  
Washington, DC 20537

The U.S. Attorney General has determined that the publication of this periodical is necessary in the transaction of the public business required by the Department of Justice. Information, instructions, and disclaimers are published in the January issues.

- MAY 2009 -

**- INTELLIGENCE ALERT -**

**ECSTASY MIMIC TABLETS (ACTUALLY CONTAINING N-BENZYLPIPERAZINE (BZP) AND CAFFEINE) IN TUCSON, ARIZONA**

The Tucson Police Department Crime Laboratory (Arizona) recently received several different types of Ecstasy mimic tablets: 5 blue dragonfly tablets (see Photo 1), 2 orange monkey face tablets (see Photo 2), 91 blue Transformers Decepticon shaped tablets (see Photo 3), 232 red, round Buddha tablets (not pictured), and 15 red, round tablets, without an imprint/design of any sort (also not pictured). The tablets were seized by the Tucson Police Department and were submitted as suspected Ecstasy. Analysis of each tablet type by GC/MS identified, not MDMA, but a mixture of approximately 4:1 N-benzylpiperazine (BZP) to caffeine (not quantitated, but a high loading based on the TIC.) There were four separate submissions to date.



**Photo 1**

[Editor's Note: BZP is a controlled substance in the U.S. (Schedule I). It is a stimulant. The



**Photo 2**



**Photo 3**

“Decepticon” tablets first appeared in the January issue; see: *Microgram Bulletin* 2009;42(1)3.]

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**- INTELLIGENCE ALERT -**

**ECSTASY MIMIC TABLETS (ACTUALLY CONTAINING BZP,  
1-(3-TRIFLUOROMETHYL)PHENYLPIPERAZINE (TFMPP), CAFFEINE,  
AND 1,4-DIBENZYLPIPERAZINE) IN OLATHE, KANSAS**

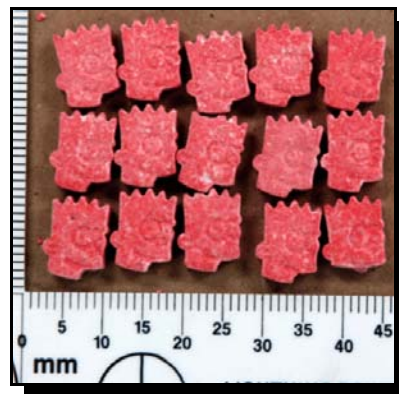
The Johnson County Crime Laboratory (Mission, Kansas) recently received 492 tablets of suspected Ecstasy. The tablets were seized by the Johnson County Sheriff's Office pursuant to a traffic stop in Olathe, Kansas. The tablets were of four types: 175 red tablets with an apple logo, (1 was approximately twice as thick as the others), 166 purple tablets with a Superman logo, 75 blue tablets with a dragonfly logo, and 76 orange tablets with a monkey face logo (no photos available). Analysis of the tablets by GC/MS confirmed, not MDMA, but rather BZP. 1,4-Dibenzylpiperazine, TFMPP, and caffeine were also detected, but not confirmed. Although not quantitated, the ratio of BZP to TFMPP was approximately 2:1 based on the TIC. The loading of both BZP and TFMPP was high compared to the other components in the sample. This is the largest submission of tablets containing BZP and TFMPP the laboratory has received.

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**- INTELLIGENCE ALERT -**

**ECSTASY MIMIC TABLETS (ACTUALLY CONTAINING BZP, TFMPP, AND  
DEXTROMETHORPHAN) IN TIFFIN, OHIO**

The Ohio Bureau of Criminal Identification and Investigation (Richfield, Ohio) recently received 15 red tablets, suspected Ecstasy (see Photo 4). The tablets were seized by the Seneca County Drug Task Force in Tiffin, Ohio (seizure details not provided). The tablets were inside a plastic bag and were shaped like a “Bart Simpson” face. The tablets resembled children's chewable vitamins in size and shape. Analysis of the tablets (total net mass 4.3 grams) by GC/FID and GC/MS identified not MDMA, but rather BZP, TFMPP, and dextromethorphan (not quantitated). The laboratory has received numerous submissions of tablets containing



**Photo 4**



BZP/TFMPP mixtures, but this was the first submission of Ecstasy or Ecstasy-mimic tablets with this shape and logo to the laboratory.

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**- INTELLIGENCE ALERT -**

**OXYCONTIN® MIMIC TABLETS (ACTUALLY CONTAINING A MIXTURE OF PHOLCODINE AND ACETAMINOPHEN) IN CHEROKEE COUNTY, GEORGIA**

The Georgia Bureau of Investigation Headquarters Laboratory (Decatur) recently received approximately 30 round, biconvex tablets imprinted with OC/80 (see Photo 5). The tablets were seized in Cherokee County by Cherokee County Sheriff's Office personnel, pursuant to a DUI traffic stop. Analysis by UV and GC/MS identified not oxycodone, but rather a mixture of pholcodine and acetaminophen (not quantitated). Also included with the exhibit were several sealed blister packs of benzodiazepines with European packaging (not pictured). This is the first known submission of OxyContin® mimic tablets containing pholcodine to this laboratory.



**Photo 5**

[Editor's Note: Pholcodine, an opium derivative, is a controlled substance in the U.S. ( Schedule I).]

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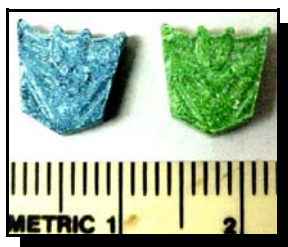
**- INTELLIGENCE ALERT -**

**ECSTASY MIMIC TABLETS (ACTUALLY CONTAINING BZP, TFMPP, DEXTROMETHORPHAN, AND CAFFEINE) IN WEST MONROE, LOUISIANA**

The North Louisiana Criminalistics Laboratory (West Monroe) recently received 200 tablets with various shapes/imprinted logos (see Photos 6-10), suspected Ecstasy. The eight different types of tablets were seized by the Lincoln Parish Narcotics Enforcement Team (no further details). The exhibit included 37 green and 19 pink Homer Simpson tablets, 31 green and 23 blue Transformers Decepticon tablets, 17 white and 20 blue Smurf tablets, 32 green Ninja Turtle tablets, and 21 white Transformers Autobot tablets. Analysis of the tablets by Marquis Reagent



**Photo 6**



**Photo 7**



**Photo 8**



**Photo 9**



**Photo 10**

and GC/MS indicated that the tablets did not contain MDMA, but rather a mixture of BZP, TFMPP, dextromethorphan, and caffeine (green Ninja Turtle tablets, white Smurf tablets and the white Transformers Autobot tablets). The remaining tablets did not contain dextromethorphan. Although not quantitated, there was a moderate to high loading of BZP and TFMPP and a low loading of caffeine and dextromethorphan, based on the TIC. The BZP and TFMPP were approximately three times more abundant than the dextromethorphan and caffeine. The laboratory has received similar submissions of these types of tablets in recent months.

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### **- INTELLIGENCE ALERT -**

#### **OXYCONTIN® MIMIC TABLETS (CONTAINING KETAMINE AND CAFFEINE)**

The Sacramento County District Attorney's Laboratory of Forensic Services (Sacramento, California) recently received 98 white round tablets with CDN/80 imprints, suspected OxyContin (see Photo 11).

The tablets were seized in Sacramento by the Sacramento Police Department during a probation search. Marijuana was also seized. The tablets were hard when scraped with a scalpel and appeared homogenous throughout. They were approximately 275 milligrams each and measured approximately one centimeter in diameter. The tablets were presumptively identified by markings using a drug reference guide as containing 80 milligrams of oxycodone manufactured by Purdue Pharma (Canada), however there was an important discrepancy; the seized tablets were white rather than green as listed in the reference guide. Analysis of the tablets (total net mass 26.95 grams) by GC/MS identified a mixture of ketamine and caffeine in an approximate 5:2 ratio based on the TIC. This is the laboratory's first submission of this type of tablet.



**Photo 11**

[Editor's Note: The following additional information was provided by the laboratory. OxyContin CDN/80 mimic tablets were reported by the Westchester County Forensic Laboratory (Valhalla, New York); contained tramadol, dicyclomine and diazepam; see: *Microgram Bulletin* 2009;42(2):15. Green, CDN/80 tablets similar in appearance were also reported by the Canadian Border Services Agency Laboratory in Ottawa; contained nitrazepam, codeine, and chlorpheniramine; see: *Microgram Bulletin* 2008;41(9):77.]

**- INTELLIGENCE ALERT -**

**ECSTASY MIMIC TABLETS (ACTUALLY CONTAINING  
1-(3-CHLOROPHENYL)-PIPERAZINE (mCPP)) IN PASADENA, TEXAS**

The Pasadena Regional Crime Laboratory (Pasadena, Texas) recently received a submission of 20 round blue tablets, each with a leaping dolphin imprint (not pictured), suspected MDMA. The tablets were seized by Pasadena Police Department personnel in connection with an on-going investigation (no further details). The tablets were medium blue in color with a granular surface that crumbled easily. Each tablet weighed approximately 150 milligrams. Analysis of the tablets by GC/MS, GC-FID, and UV identified 1-(3-chlorophenyl)-piperazine (mCPP) rather than MDMA. This is the laboratory's first encounter with tablets containing mCPP. Recent similar submissions contained BZP and TFMPP, usually with caffeine and/or procaine.

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**- INTELLIGENCE ALERT -**

**OXYCONTIN® MIMIC TABLETS (ACTUALLY CONTAINING  
DEXTROMETHORPHAN/LEVOMETHORPHAN, AND DIAZEPAM) OUTSIDE OF  
PHILADELPHIA, PENNSYLVANIA**

NMS Labs (Willow Grove, Pennsylvania) recently received a submission of twelve suspected oxycodone tablets from the Towamencin Township Police Department in Kulpsville, Pennsylvania. The round, green tablets had an "OC" imprint on one side and an "80" on the other side (similar to 80 milligram OxyContin® tablets). The tablets were submitted in three separate bags and each tablet weighed approximately 0.36 grams. Upon examination, it was noted that the tablets were not representative of typical OxyContin® tablets received by the laboratory (see Photo 12; mimic tablets are on the left and the licit OxyContin® tablets are on the right). Analysis of the tablets (total net mass 4.44 grams) by TLC and GC/MS identified no oxycodone, but rather methorphan and diazepam (not quantitated). The laboratory has previously received mimic OxyContin® tablets, but this is the first submission to contain these drugs.



**Photo 12**

Mimic tablets on left, licit tablets on right.

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**- INTELLIGENCE ALERT -**

**TABLETS IN THAI TOOTHPASTE TUBES IN SAN FRANCISCO, CALIFORNIA**

The DEA Western Laboratory (San Francisco, California) recently received 1,987 red and green tablets inscribed with a "WY" imprint, suspected methamphetamine. The tablets were seized in San Francisco by Immigration and Customs Enforcement (ICE) personnel (details sensitive). The tablets were concealed within plastic straws hidden in the actual paste. There were nine



**Photo 13**



**Photo 14**

toothpaste boxes labeled with Thai writing. Each box contained two tubes of toothpaste each with three sealed straws inside (see Photos 13-14). Each straw further contained approximately 36 tablets. Analysis of the tablets (total net mass 176.4 grams) by Marquis Reagent, GC/MS, GC/IRD, FTIR, and HPLC confirmed 7.4 milligrams/tablet of methamphetamine and caffeine. This is the first instance of this type of concealment method seen at the Western Laboratory.

\* \* \* \* \*

### **- INTELLIGENCE ALERT -**

### **COCAINE CONCEALED IN RELIGIOUS PLAQUES IN MIAMI, FLORIDA**



**Photo 15**



**Photo 16**



**Photo 17**



**Photo 18**

The DEA Mid-Atlantic Laboratory (Largo, Maryland) received two exhibits with a total of six wooden plaques with religious imagery (see Photos 15-18). The exhibits were initially seized in Miami, Florida by U.S. Immigration and Customs Enforcement (ICE) personnel. Each exhibit consisted of three plaques with a compartment behind the image. The compartments were lined with aluminum foil and carbon paper and contained white powder. Analysis of the powder (total net masses 1,488 grams and 1,307 grams) by GC/MS, FTIR, and GC confirmed 70.1% and 76.5% cocaine hydrochloride with levamisole and diltiazem.

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### **- INTELLIGENCE ALERT -**

### **FREEZE-DRIED KHAT IN CHICAGO, ILLINOIS**

The DEA North Central Laboratory (Chicago, Illinois) recently received two large plastic bags of dry, crunchy, dark green plant material, suspected khat. The plant material was seized by U.S. Immigration and Customs Enforcement personnel from a mail parcel at a retail parcel store in Chicago. The plant material appeared freeze-dried and was contained in two knotted, plastic



bags. Analysis of the plant material (total net mass 3,707 grams) by GC/MS and GC-FID (with N-trifluoroacetyl-*l*-prolyl chloride (*l*-TPC) derivitization) identified cathinone and cathine in both samples; no quantitation. Freeze-dried khat was analyzed at least one other time at the North Central Laboratory, and is received infrequently.

\* \* \* \* \*

## SELECTED REFERENCES

[The Selected References section is a compilation of recent publications of presumed interest to forensic chemists. Unless otherwise stated, all listed citations are published in English. Abbreviated mailing address information duplicates that provided by the abstracting service. Patents and Proceedings are reported only by their *Chemical Abstracts* citation number.]

1. Abdullah AFL, Miskelly GM. **Formation of trifluoroacetylated ephedrine during the analysis of a pseudoephedrine-formaldehyde adduct by TFAA derivatization followed by GC-MS.** *Journal of Forensic Sciences* 2009;54(2):365-369. [Editor's Notes: Presents the title study. Contact: Forensic Science Programme, The University of Auckland, Auckland, N.Z.]
2. Almirall J, Perr J, Guerra P. **Method and apparatus for extraction, detection, and characterization of vapors from explosives, taggants in explosives, controlled substances, and biohazards.** (Patent) *Chemical Abstracts* 2009:394922.
3. Bennett MJ, Steiner RR. **Detection of gamma-hydroxybutyric acid in various drink matrices via accuTOF-DART.** *Journal of Forensic Sciences* 2009;54(2):370-375. [Editor's Notes: A new screening method for detecting gamma-hydroxybutyric acid (GHB) in drink matrices via accuTOF-DART was validated and compared with the current screening methods. Contact: Department of Forensic Science, Virginia Commonwealth University, Richmond, VA 23284.]
4. Casale JF, Toske SG, Hays PA. **Chlorinated opium alkaloid derivatives produced by the use of aqueous sodium hypochlorite during the clandestine manufacture of heroin.** *Journal of Forensic Sciences* 2009;54(2):359-364. [Editor's Notes: A clandestine chemist produced heroin from crude morphine utilizing a solution of sodium hypochlorite during the process. Numerous chlorinated opium alkaloid derivatives were created when the morphine acetylation reaction was quenched and neutralized with a solution of sodium hypochlorite and ammonium hydroxide. Although no illicit heroin exhibits containing these compounds have been observed in seizures to date, mass spectral data are provided for several of these compounds for their identification should they be seen in the future. Contact: Special Testing and Research Laboratory, Drug Enforcement Administration, U.S. Department of Justice, Dulles, VA.]
5. de Veij M, Vandenabeele P, DeBeer T, Remon JP, Moens L. **Reference database of Raman spectra of pharmaceutical excipients.** *Journal of Raman Spectroscopy* 2009;40(3):297-307. [Editor's Notes: The focus in this field is mainly on the active ingredients and not on the excipients present in the drugs. A collection of Raman spectra of widely used pharmaceutical excipients is presented in this article, which can serve as a reference for the interpretation of Raman spectra during drug analysis. Contact: Department of Analytical Chemistry, Ghent University, Ghent B-9000, Belg.]
6. Kolomiets YN, Pervukhin VV. **Effect of UV irradiation on detection of cocaine hydrochloride and crack vapors by IMIS and API-MS methods.** *Talanta* 2009;78(2):542-547. [Editor's Notes: Presents the title study. Contact: Nikolaev Institute of Inorganic Chemistry, SB RAS, Novosibirsk, Russia 630090.]

7. Piggee C. **Investigating a not-so-natural high.** Analytical Chemistry 2009;81(9):3205-3207. [Editor's Notes: A review. Researchers identify synthetic cannabinoids in herbal incense. Contact: No additional information was given.]
8. Singh BK, Parwate DV, Shukla SK. **Rapid color test identification system for screening of counterfeit fluoroquinolone.** E-Journal of Chemistry [online computer file] 2009; 6(2):377-384. [Editor's Notes: Presents the title study. Contact: Department of Chemistry, RTM Nagpur University, Nagpur, 440033 India.]

#### **Additional References of Possible Interest:**

1. Assuncao NA, Bechara EJH, Simionato AVC, Tavares MFM, Carrilho E. **Capillary electrophoresis coupled to mass spectrometry (CE-MS): twenty years of development.** Quimica Nova 2008;31(8):2124-2133. [Editor's Notes: A review of title topic. Contact: Departamento de Bioquimica, Instituto de Quimica, Universidade de Sao Paulo, 05513-970 Sao Paulo, Brazil.]
2. Blitzer H. **Scanning system and techniques for medical and/or forensic assessment using the same.** (Patent) Chemical Abstracts 2009:335631.
3. Zhang C, Johnson LW. **Single quantum-dot-based aptameric nanosensor for cocaine.** Analytical Chemistry 2009;81(8):3051-3055. [Editor's Notes: Recent advances in aptameric sensors hold promise for wide application in forensic analysis, environmental monitoring, and clinic diagnostics. A single-QD-based aptameric sensor that is capable of sensing the presence of cocaine through both signal-off and signal-on modes was developed. In comparison with the established aptameric sensors, this single-QD-based aptameric sensor has the significant advantages of simple sample preparation, high sensitivity, and extremely low sample consumption. Contact: Department of Chemistry, York College and The Graduate Center, The City University of New York, Jamaica, NY 11451.]

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# Microgram

## *Bulletin*

**Published by:**

The Drug Enforcement Administration  
Office of Forensic Sciences  
Washington, DC 20537

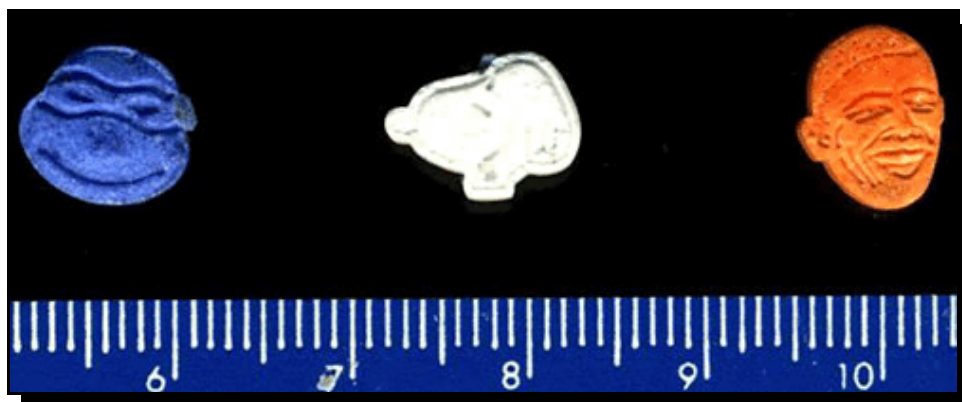
The U.S. Attorney General has determined that the publication of this periodical is necessary in the transaction of the public business required by the Department of Justice. Information, instructions, and disclaimers are published in the January issues.

- JUNE 2009 -

**- INTELLIGENCE ALERT -**

**ECSTASY MIMIC TABLETS (ACTUALLY CONTAINING N-BENZYLPIPERAZINE (BZP), 1-(3-TRIFLUOROMETHYL)PHENYLPIPERAZINE (TFMPP), AND CAFFEINE) IN ASHEVILLE, NORTH CAROLINA**

The North Carolina State Bureau of Investigation, Western Regional Laboratory (Asheville, North Carolina) received five tablets shaped like the heads of Ninja Turtles, Snoopy, and Barack Obama, suspected Ecstasy (see Photo 1). Analysis of the tablets by GC/MS revealed that the tablets contained BZP, TFMPP, and caffeine (the predominant compound). Clandestine tablet



**Photo 1**-Scale is centimeters

preparations containing BZP are common submissions; however, these were the first tablets of their kind to be submitted to the laboratory. Most tablets submitted are round and vary in imprint/stamps. These tablets were quite detailed.

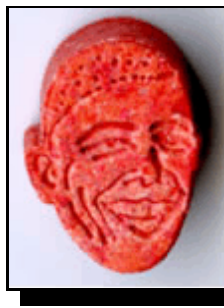
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**- INTELLIGENCE ALERT -**

**NEW TREND IN ECSTASY MIMIC TABLETS SEEN IN SOUTHWESTERN U.S.**



**Photo 2**  
Green Obama



**Photo 3**  
Red Obama

The DEA Southwest Laboratory (Vista, California) is seeing a new trend in the shape and design of illicit tablets in seizures throughout the southwest region of the U.S. (see Photos 2-15). The laboratory is receiving Ecstasy mimic and Ecstasy exhibits with different designs, colors, and shapes than the more typical round tablets. The Ecstasy mimic designs include: Barack Obama, Homer and Bart Simpson, Snoopy, Ninja Turtles, and Transformer Decepticon and Autobot designs. The contents of the tablets vary, but generally include a mixture of BZP, TFMPP, and caffeine. Other components in some tablets are dextromethorphan, methamphetamine, and dimethylsulfone. Ecstasy designs include: a mushroom (resembling one from the Super Mario Brothers video game) and Garfield. The mushroom and Garfield Ecstasy tablets contain 3,4-methylenedioxymethamphetamine (MDMA), methamphetamine, and caffeine.



**Photo 4**  
Homer Simpson



**Photo 5**  
Bart Simpson



**Photo 6**  
Snoopy  
(White)



**Photo 7**  
Snoopy  
(Blue)



**Photo 8**  
Ninja Turtle



**Photo 9**  
Autobot  
(White)



**Photo 10**  
Decepticon  
(Blue)



**Photo 11**  
Decepticon  
(Green)



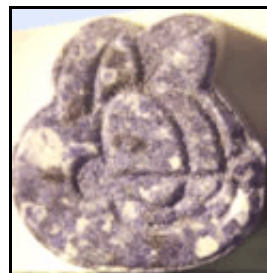
**Photo 12**  
Autobot  
(Red)



**Photo 13**  
Mushroom



**Photo 14**  
Garfield  
(Blue)



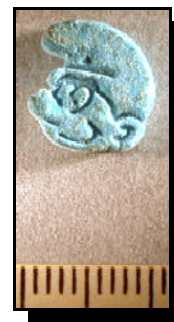
**Photo 15**  
Garfield  
(Purple)

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### **- INTELLIGENCE ALERT -**

#### **OBAMA, SNOOPY, AND OTHER BZP TABLET TRENDS APPEAR IN OKLAHOMA**

The Oklahoma State Bureau of Investigation Northeast Regional Laboratory (Tahlequah, Oklahoma) received 100 tablets of suspected MDMA. The tablets were of various cartoon shapes including: Autobot, Decepticon, Bart and Homer Simpson, Ninja Turtle, and Smurf (see Photo16). There were also some tablets shaped like Barack Obama and Snoopy. Analysis of the tablets by GC/FID and GC/MS confirmed BZP, TFMPP, and caffeine. No quantitative analysis was performed. This is the second submission of BZP to the laboratory.



**Photo 16**

\* \* \* \* \*

**- INTELLIGENCE ALERT -**

**COUNTERFEIT PHENTERMINE TABLETS (ACTUALLY CONTAINING FENFLURAMINE) IN MISSION, KANSAS**

The Johnson County Crime Laboratory (Mission, Kansas) received a submission of 18 oval-shaped, white tablets with blue speckles (see Photo 17). The tablets were imprinted with "A 159." A reference search of the imprint indicated that the tablets should contain phentermine hydrochloride. However, analysis by GC/MS, confirmed the presence of fenfluramine (not quantitated, but a high loading based on the TIC), which was removed from the U.S. market in 1997. This was the first submission of this type tablet to the laboratory.



**Photo 17**

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**- INTELLIGENCE ALERT -**

**RECORD SEIZURE OF PHENCYCLIDINE BY KANSAS BUREAU OF INVESTIGATION**

The Kansas Bureau of Investigation Laboratory (Great Bend) received 10 one-liter plastic bottles containing a straw-colored liquid with a strong ether-like odor, suspected phencyclidine (PCP). The bottles were in an ice-filled cooler (see Photo 18) in the trunk of a vehicle. The caps on all the bottles were further sealed with an adhesive substance. Preliminary analysis revealed a basic pH. Analysis of the liquid by GC/MS confirmed ethyl ether and an average concentration of 65.5 milligrams/milliliter PCP (ranging from 47-89 milligrams/milliliter). This was the largest exhibit of PCP submitted to the laboratory and the only instance of this packaging method.



**Photo 18**

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**- INTELLIGENCE ALERT -**

**LIQUOR BOTTLES CONTAINING XYLAZINE SOLUTION IN CLEVELAND, OHIO**

The Ohio Bureau of Criminalistics Identification and Investigation (Richfield, Ohio) received two bottles of clear liquid suspected to contain dissolved cocaine (not pictured). The bottles contained a total of 1,253 grams of liquid. Analysis by color test indicated a positive blue color, suggesting the presence of cocaine; however, GC/MS and FTIR confirmed xylazine, a veterinary product used in the sedation of large animals, which is not controlled under US federal law. This is the first submission of this kind to the laboratory. [Editor's Notes: Xylazine is reportedly a common heroin adulterant in Puerto Rico and has been linked to nine deaths. Additional information on this topic can be found in the American Academy of Forensic Sciences 2009



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**- INTELLIGENCE ALERT -**

**OXANDROLONE “PAPERS” AT THE DALLAS/FORT WORTH AIRPORT**

The DEA South Central Laboratory (Dallas, Texas) received two white paper layers, glued together (not pictured), suspected LSD. Presumptive screening with ultraviolet light and paradimethylaminobenzaldehyde were negative for LSD. Analysis by GC/MS, HPLC, and FTIR identified oxandrolone (controlled in the US as a Schedule III steroid) in residual amounts. This is the first instance in which the laboratory received a steroid exhibit of this type.

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**- INTELLIGENCE ALERT -**

**“CAT CLAW” AT MIAMI INTERNATIONAL AIRPORT**

The DEA Southeast Laboratory (Miami, Florida) received 12 bags of “Uña De Gato,” or “cat claw” (see Photos 19 and 20), suspected to contain cocaine hydrochloride. The white powder was contained in plastic bags wrapped in black tape. The black-taped packages were further contained in pieces of hollowed out parquet flooring. Strips of bark (similar to actual “Uña De Gato”) were glued to all sides of the hollowed out flooring. Analysis of the white powder (total net mass 3,893 grams) by GC/MS and FTIR confirmed 93% cocaine hydrochloride.



**Photo 19**



**Photo 20**

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## **- INTELLIGENCE ALERT -**

### **BZP TABLETS IN NEW YORK, NEW YORK**

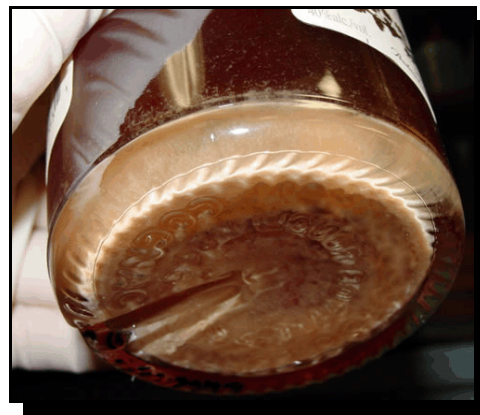
The DEA Northeast Laboratory (New York, New York) received 170 purple tablets (not pictured) with a Transformer Decepticon logo. Analysis of the tablets (total net mass 49 grams) by GC/MS, GC/FID and HPLC-MSD indicated 139 milligrams/tablet of BZP with TFMPP and caffeine. The laboratory has received numerous submissions of tablets containing BZP; however, this is the second known submission of the purple Transformer Decepticon logo tablets containing BZP.

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## **- INTELLIGENCE BRIEF -**

### **DEXTROPROPOXYPHENE-LACED COGNAC LIQUOR IN MICHIGAN**

The Michigan State Police Forensic Laboratory (Sterling Heights, Michigan) received a submission of an opened bottle of cognac liquor suspected to contain 21 dissolved Darvocet tablets (see Photo 21). The exhibit was seized after a man reportedly became ill from drinking the cognac. During initial examination, a chalky substance and sediment were observed in the brown liquid inside the bottle. Analysis of the exhibit by GC/MS, GC, and crystal test identified dextropropoxyphene and acetaminophen, ingredients of the commercial preparation Darvocet.



**Photo 21**

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## **SELECTED REFERENCES**

[The Selected References section is a compilation of recent publications of presumed interest to forensic chemists. Unless otherwise stated, all listed citations are published in English. Abbreviated mailing address information duplicates that provided by the abstracting service. Patents and Proceedings are reported only by their *Chemical Abstracts* citation number.]

1. Bonadio F, Margot P, Delemont O, Esseiva P. **Optimization of HS-SPME/GC-MS analysis and its use in the profiling of illicit ecstasy tablets (Part 1).** *Forensic Science International* 2009;187(1-3):73-80. [Editor's Notes: A headspace solid-phase microextraction procedure (HS-SPME) was developed for the profiling of traces present in 3,4-methylenedioxymethylamphetamine (MDMA). A total of 31 compounds were identified as traces related to MDMA synthesis. The use of a restricted set of 10 target compounds was also proposed for developing a screening tool for clustering samples having a close profile. The results show that HS-SPME, coupled with the suitable statistical method, is a powerful tool for profiling. Contact: Ecole des Sciences Criminelles, Institut de Police Scientifique, University of Lausanne, Batochime, Lausanne-Dorigny CH-1015, Switzerland.]



2. Brewster VL, Edwards HGM, Hargreaves MD, Munshi T. **Identification of the date-rape drug GHB and its precursor GBL by Raman spectroscopy.** *Drug Testing and Analysis* 2009;1(1):25-31. [Editor's Notes: Using bench-top and portable Raman spectroscopy, gamma hydroxybutyric acid (GHB) as a sodium salt and GBL are detected in a variety of containers. The detection of both GBL and GHB in a range of liquid matrixes simulating "spiked" beverages is also demonstrated. Contact: Raman Spectroscopy Group, Division of Chemical and Forensic Sciences, University of Bradford BD7 1DP, UK.]
3. Gostic T, Klemenc S, Stefane B. **A study of the thermal decomposition of adulterated cocaine samples under optimized aerobic pyrolytic conditions.** *Forensic Science International* 2009;187(1-3):19-28. [Editor's Notes: Presents the title study. Contact: Ministry of the Interior, Forensic Research Center, Vodovodna 95, Ljubljana 1000, Slovenia.]
4. Kocak A, Lucania JP, Berets SL. **Some advances in Fourier transform infrared transflection analysis and potential applications in forensic chemistry.** *Applied Spectroscopy* 2009;63(5):507-511. [Editor's Notes: The transflection technique has a higher sensitivity for bands in the mid-IR offering a significant potential for both qualitative and quantitative analysis in this region. Small amounts of illegal drugs can be identified with little or no sample preparation. Contact: John Jay College of Criminal Justice, Department of Sciences, The City University of New York, New York, NY 10019.]
5. Milliet Q, Weyermann C, Esseiva P. **The profiling of MDMA tablets: A study of the combination of physical characteristics and organic impurities as sources of information.** *Forensic Science International* 2009;187(1-3):58-65. [Editor's Notes: Presents the title study. Contact: Ecole des Sciences Criminelles, Institut de Police Scientifique, University of Lausanne, Batochime, Lausanne-Dorigny CH-1015, Switzerland.]
6. Westphal F, Junge T, Girreser U, Stobbe S, Perez SB. **Structure elucidation of a new designer benzylpiperazine: 4-Bromo-2,5-dimethoxybenzylpiperazine.** *Forensic Science International* 2009;187(1-3):87-96. [Editor's Notes: A new designer benzylpiperazine was seized in Hamburg, Germany for the first time. Interpreting the results of GC-MS, GC-MS/MS, and NMR identified the compound as 4-bromo-2,5-dimethoxybenzylpiperazine. Additional instrumental data is presented. Contact: Landeskriminalamt Schleswig-Holstein, Muehlenweg 166, Kiel 24116, Germany.]

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## THE DEA FY 2010 STATE AND LOCAL FORENSIC CHEMISTS SEMINAR SCHEDULE

The FY 2010 schedule for the State and Local Forensic Chemists Seminar is as follows:

November 2-6, 2009  
March 1-5, 2010  
May 31-June 4, 2010  
September 13-17, 2010

The school is open only to forensic chemists working for law enforcement agencies. It is intended for chemists who have completed their agency's internal training program and have also been working on the bench for at least one year. There is no tuition charge. The course is held at the Hyatt Place Dulles North Hotel in Sterling, Virginia (near the Washington/Dulles International Airport). A copy of the application form is reproduced on the last page of the August 2004 issue of *Microgram Bulletin* (see: <http://www.dea.gov/programs/forensicsci/microgram/mg0804/aug04.pdf>). Completed applications

should be mailed to the Special Testing and Research Laboratory (Attention: J. Head) at: 22624 Dulles Summit Court, Dulles, VA 20166. For additional information, call 703/668-3349.

## SCIENTIFIC MEETINGS

**Title:** 19<sup>th</sup> Annual CLIC Technical Training Seminar

**Sponsoring organization:** Clandestine Laboratory Investigating Chemists Association

**Inclusive dates:** September 9-12, 2009 (September 8-workshop)

**Location:** Sheraton Hotel in Birmingham, Alabama

**Additional info:** Meeting fee-\$350 for members and \$400 for non-members.

Workshop topic-Basic Methamphetamine Synthesis

Workshop Fee-\$125 for members and \$150 for non-members

**Contact information:** Pam Smith, Email: p1947s -at- hotmail.com (Replace the word -at- with the symbol @)

**Website:** None

\* \* \* \* \*

# Microgram

## *Bulletin*

**Published by:**

The Drug Enforcement Administration  
Office of Forensic Sciences  
Washington, DC 20537

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- JULY 2009 -

### KHAT SUBMISSION IN ILLINOIS

The Illinois State Police Morton Crime Laboratory received four zip-top plastic bags of plant material, suspected marijuana and *Salvia*. Of the four bags of plant material, only one was suspected marijuana and the others had a different type of appearance, consistent with freeze-dried khat (*Catha edulis*). However, analysis of the largest exhibit (total net mass 90.9 grams, see Photo 1) by GC/MS identified cathinone and cathine (consistent with khat).



**Photo 1**

The freeze-dried khat.

[Editor's notes: Additional information provided by the laboratory: In Illinois, cathinone is a schedule I controlled substance and cathine is schedule IV. ]

\* \* \* \* \*

## 4-METHYLMETHCATHINONE IN OREGON

The Oregon State Police Bend Forensic Laboratory received two submissions of white powder (see Photo 2) that were referred to by users as “sunshine.” The first submission contained 17 plastic bags of white powder (total net mass 15.7 grams). A second submission contained two plastic bags of white powder (total net mass 5.5 grams). The powder was originally suspected to



**Photo 2**

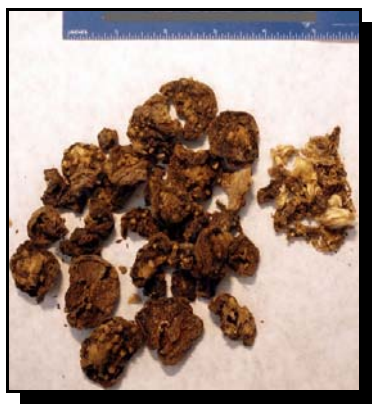
be 3,4-methylenedioxymethcathinone (MDMCat). However, analysis of both samples by color testing and GC/MS indicated not MDMCat, but 4-methylmethcathinone (4-MMC or mephedrone). The apparent 4-MMC was not quantitated, but was present in a moderate to high concentration based on the TIC.

[Editor’s Notes: Additional information provided by the laboratory: The presence of 4-MMC in the white powder has not been confirmed (no authenticated standard to use for comparison). However, the mass spectral data matches data received from the Victoria Police Forensic Services Department in Australia.]

\* \* \* \* \*

## PEYOTE BUTTONS IN OKLAHOMA

The Oklahoma City Police Department Forensic Drug Laboratory received a multiple drug case consisting of plant material, tablets, and white powder; suspected peyote, marijuana, Ecstasy, and cocaine. The peyote exhibit (see Photo 3) was the largest amount (total net mass 49.4 grams) of dried peyote ever submitted to the laboratory. Analysis of the “buttons” by microscope, color reagents, GC/FID, and GC/MS confirmed the presence of mescaline (not



**Photo 3**

quantitated, but a much higher concentration than expected). The marijuana (total net mass 2,209 grams) was contained in six zip-top plastic bags and was identified via analysis by microscopy, Duquenois-Levine test, and thin layer chromatography (TLC). Also submitted were 17 pinkish-orange tablets with the Puma logo imprinted on one side and 65 yellow-green tablets with a smiley face imprinted on one side. Analysis confirmed the presence of 3,4-methylenedioxymethamphetamine (MDMA) in each tablet type. The white powder (contained in six plastic bags) was identified as cocaine salt (total net mass 74.6 grams). The MDMA tablets and the cocaine were identified using color reagents, GC/FID, and GC/MS. No quantitative analyses were performed.

\* \* \* \* \*

## LAMINATED RECIPE SHEET CONTAINING TRACE COCAINE

The DEA Special Testing and Research Laboratory received one laminated sheet of cooking recipes from Quito, Ecuador (see Photos 4 and 5). The item was obtained from an anonymous source. It is believed the final destination of the menu was the United States. The sheet was laminated on one side and folded like a typical restaurant menu. Analysis of clippings from the sheet (total net mass 41.1 grams) by color test (cobalt thiocyanate), GC/FID, and GC/MS identified trace cocaine.

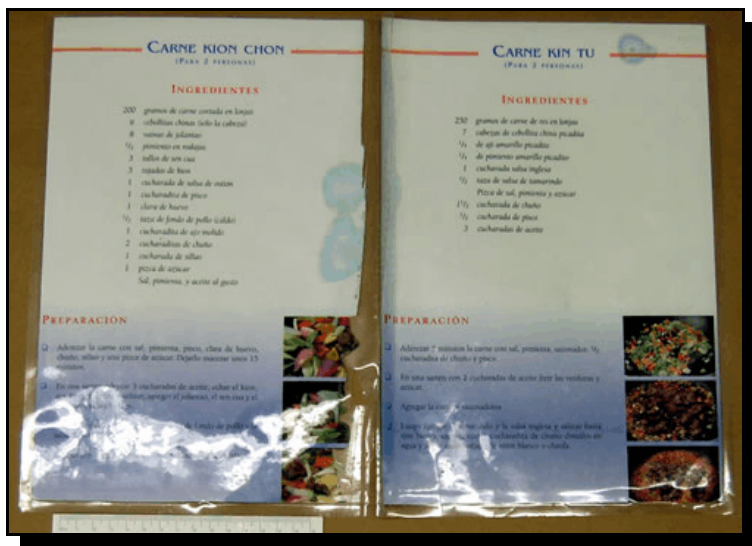


Photo 4-Front side



Photo 5-Reverse side

[Editor's Notes: Additional information provided by the laboratory: the DEA Southeast Laboratory received a similar exhibit in 2007, but the exhibit's interior contained a thin layer of visible cocaine hydrochloride powder covered by a film-like plastic wrap; see: Microgram Bulletin 2007:40(10):93.]

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## VARIOUS TABLETS CONTAINING BZP AND TFMPP IN WASHINGTON, DC

The DEA Mid-Atlantic Laboratory received 10 small, round tablets with five different imprints, suspected Ecstasy (see Photo 6). Analysis by Marquis color test, GC, and GC/MS was performed on each type tablet. There were three tablet types with the same components: a red tablet with a seated woman design, a white tablet with a Playboy bunny design, and a light blue tablet with the LG Corporation logo (upside down in the photo). The three tablets each contained 3,4-methylenedioxymethamphetamine (MDMA), methamphetamine, and caffeine. A purple tablet with a rabbit design contained N-benzylpiperazine (BZP) and 1,3-trifluoromethylphenylpiperazine (TFMPP). Lastly, a lavender tablet with a penguin design contained MDMA, caffeine, and procaine.



Photo 6

\* \* \* \* \*

## OXYCONTIN® MIMIC TABLETS (ACTUALLY CONTAINING MELATONIN AND ACETAMINOPHEN) IN FLORIDA

The Florida Department of Law Enforcement Fort Myers Regional Operations Center received a submission of several mimic OxyContin® 80 milligram oxycodone tablets (not pictured). Analysis of the tablets by GC/MS identified melatonin and acetaminophen (not quantitated, but a 20:80 ratio based on the TIC). The mimic tablets had an “OC” on one side with an imprint width of 0.50 centimeters and an “80” on the other side with an imprint width of 0.50 centimeters. The mimic tablet dimensions were a diameter of 0.90 centimeters and thickness of 0.45 centimeters with an inconsistent weight of 0.24 to 0.26 grams. By comparison, the authentic OxyContin® tablets had an “OC” imprint width of 0.35 centimeters and an “80” on the other side with an imprint width of 0.45 centimeters. The dimensions of the authentic tablets were 0.85 centimeters in diameter and 0.50 centimeters thick with a consistent weight of 0.27 grams. The mimic tablets had a smoother surface and slightly darker shade of green than the authentic tablets.

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## SELECTED REFERENCES

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1. King LA. Forensic chemistry of substance misuse: a guide to drug control. 1<sup>st</sup> ed. Cambridge, UK: Royal Society of Chemistry, 2009;249.

### Additional References of Possible Interest:

1. Berets SL, Kocak A, Lucania JP. **Some advances in Fourier transform infrared transfection analysis and potential applications in forensic chemistry.** Applied Spectroscopy 2009;63(5):507-511. [Editor's Notes: A discussion of the advantages and application of the subject technique. Contact: John Jay College of Criminal Justice, Department of Sciences, The City University of New York, New York, NY 10019.]

\* \* \* \* \*

## THE JOURNAL/TEXTBOOK COLLECTION EXCHANGE

The Journal/Textbook Collection Exchange is a service intended to facilitate the transfer of unwanted journals and textbooks to forensic libraries or other *Microgram* subscribers. At present, this service is offered once a quarter (in January, April, July, and October). The current donations are listed below. The offers are First Come/First Serve (except **libraries have preference**). There are no charges to the requestor. Please provide a full mailing address in the request. **Important!:** Do not provide an address that irradiates mail!

*Federal Criminal Code and Rules* - 2008 Edition (13 copies)

**All subscribers are encouraged to donate surplus or unwanted items/collections.** Reference texts and long runs of forensic/analytical journals are of particular interest; however, even single issues are worthwhile, and may fill a hole in an existing collection. If interested, please consult the *Microgram* website or contact the *Microgram* Editor for further instructions.

The next offering of journals and textbooks will be in the October 2009 issue of *Microgram Bulletin*.

\* \* \* \* \*

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- AUGUST 2009 -

### MARIJUANA “BUTTER” IN MISSISSIPPI

The Mississippi Crime Laboratory analyzed a yellow semi-solid substance with a rancid odor, suspected marijuana “butter” (see Photo 1). Preliminary testing with the Duquenois-Levine test was positive for cannabinoids, but a microscopic examination of the substance did not reveal the presence of any characteristic botanical features. The sample was extracted using a Toxi-Tube A (commercial product). Analysis of the substance (total net mass 21.6 grams) by GC/MS confirmed the presence of delta-9-tetrahydrocannabinol (the THC was not formally quantitated, but a relatively high loading based on TIC). A separate exhibit contained 447.4 grams of marijuana. This was the first known submission of marijuana butter, also known as “cannabutter,” to the Mississippi Crime Laboratory system.

[Editor’s Notes: For previous issues featuring a similar substance called “ganja butter” see Microgram Bulletin 2007;40(7):66 and 2007;40(8):77.]



Photo 1

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## **VICODIN® MIMIC TABLETS (ACTUALLY CONTAINING HEROIN, DIAZEPAM ACETAMINOPHEN, AND CAFFEINE) IN CANADA**

The Canada Border Services Agency (CBSA) Laboratory received five white tablets imprinted with “VICODIN ES” on one face and a score line on the opposite face, suspected to be counterfeit US Vicodin ES® tablets (see Photos 2 and 3). The tablet



**Photo 2**

**Photo 3**

exhibits were selected from a larger seizure. The tablets had a dusty and slightly worn surface and averaged 15.3 millimeters long, 9.8 millimeters wide, 5.9 millimeters thick, and weighed 772 milligrams each. Analysis by FTIR, GC/MS, and ion mobility spectrometry (IMS), indicated not acetaminophen and hydrocodone bitartrate, but rather acetaminophen and small amounts of heroin, diazepam and caffeine (not quantitated). This is the first submission of Vicodin® mimic tablets to the laboratory.

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## **BUNNY SHAPED ECSTASY MIMIC TABLETS (ACTUALLY CONTAINING FLUOROPHENYLPIPERAZINE, FPP)**



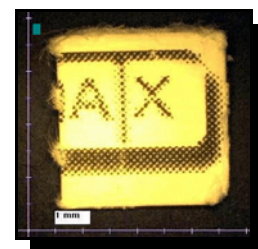
**Photo 4**

The California Department of Justice Laboratory received 12 red Playboy bunny tablets, suspected Ecstasy (see Photo 4). Analysis of two of the tablets by GC/MS indicated, not MDMA, but fluorophenylpiperazine (FPP). The laboratory has received numerous BZP/TMFPP Ecstasy mimic tablets, but this is the first submission received containing FPP.

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## **“XANAX” BLOTTER PAPER IN KANSAS**

The Sedgwick County Regional Forensic Science Center received a partial blotter paper square, suspected LSD. Both sides of the square were printed with a partial picture of a tablet and the word “XANAX” (see Photo 5). Methanolic extracts of the paper did not fluoresce under UV irradiation or produce the proper violet to purple color, indicative of LSD, with Ehrlich’s (or Van Urk’s) reagent. Analysis by GC/MS identified the presence of alprazolam (not quantitated). Xanax is a trade name for alprazolam. This was the first time a prescription drug was found on blotter paper by the laboratory.



**Photo 5**

[Editor’s Notes: The same type blotter paper, also with alprazolam, was reported in a previous issue of Microgram. See Microgram Bulletin 2008;41(5):45.]

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## MIMIC ALPRAZOLAM TABLETS IN TEXAS

The Texas Department of Public Safety Crime Laboratory received a prescription pill bottle containing 92 white rectangular tablets with imprint GG249, suspected alprazolam. The tablets were all similar in appearance; however, 90 of the tablets weighed 0.33 gram each, while two weighed the expected 0.26 grams (see Photo 6; mimic tablet on the left and the real tablet on the right). Analysis by UV and GC/MS of the 0.33 gram tablets identified, not alprazolam, but rather diazepam (not quantitated). This is the first known submission of alprazolam mimic tablets containing diazepam to the laboratory.



Photo 6

\* \* \* \* \*

## FENTANYL POWDER IN COOLER IN NEW MEXICO

The DEA South Central Laboratory received 17 sealed, clear, plastic FoodSaver brand bags, each containing a fine white powder, suspected cocaine (not pictured). The 17 packages were found concealed in the liner of an Igloo brand cooler. Each package contained approximately 300 grams of a fine white powder, for a total net mass of 4,973 grams. Initial screening of each package by GC/MS and GC/FID identified not cocaine, but rather caffeine, lidocaine, and fentanyl. Further analysis by LC/MS, FTIR, and HPLC confirmed 6.3% fentanyl (calculated as the hydrochloride) and also identified lactose in the sample. This is the second exhibit of this kind submitted to the laboratory from New Mexico since 2007 (see Microgram Bulletin 2007;40(12):113).

[Editor's Notes: Fentanyl powder mixed with lactose and placed in vacuum-seal type plastic bags was reported by the DEA Southwest Laboratory in 2007. See Microgram Bulletin 2007;40(4):41.]

\* \* \* \* \*

## SUGAR-LACED MARIJUANA AT CALIFORNIA POINT OF ENTRY

The DEA Southwest Laboratory received multiple bundles of plant material, suspected marijuana saturated with sugar crystals (see Photo 7). Analysis of the plant material (total net mass 65 kilograms) by microscopic examination, thin layer chromatography (TLC) and Duquenois-Levine color test confirmed marijuana. Analysis of the sugar crystals by IR identified sucrose. The laboratory received one other submission of this type of marijuana.



Photo 7

\* \* \* \* \*

## UNUSUAL BZP TABLETS IN NEW YORK

The DEA Northeast Laboratory received 7,792 tablets with eight different types of logos, suspected Ecstasy (see Photo 8). Analysis of the tablets (total net mass 2,345 grams) by GC/MS, GC/FID, and FTIR identified 122.2 milligrams of N-benzylpiperazine (BZP) per tablet, 1,3-trifluoromethylphenylpiperazine (TFMPP), and caffeine. The laboratory has received these type tablets in the past, but the tablets contained ingredients other than BZP.



Photo 8

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## MARIJUANA WITH “JOKER” LOGO IN FLORIDA

The DEA Southeast Laboratory received nine small, zip-top plastic bags of plant material, suspected marijuana. The nine zip-top plastic bags each had a “Joker” sticker affixed to the outside. Analysis of the substance (total net mass 11.9 grams) confirmed marijuana. This was the first known submission of the “Joker” sticker to the laboratory.

\* \* \* \* \*

## ECSTASY/PIPERAZINE COMBINATION TABLETS IN NEW YORK

The DEA Northeast Laboratory received two off-white tablets (see Photo 9) depicting Barack Obama on a contoured tablet. Analysis of the tablets (total net mass 0.60 gram) by GC/MS, GC/FID and color test indicated N-benzylpiperazine (BZP), 1,3-trifluoromethylphenylpiperazine (TFMPP), 3,4-methylenedioxymethamphetamine (MDMA), procaine, and caffeine. This is the first known submission of the Obama logo tablets containing BZP to the laboratory.



Photo 9

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## SELECTED REFERENCES

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1. Cawley AT, Collins M, Heagney AC, Kissane L, Robertson J, Salouros H. **Delta13C, delta15N and delta2H isotope ratio mass spectrometry of ephedrine and pseudoephedrine: application to methylamphetamine profiling.** Rapid Communications in Mass Spectrometry



2. Ikehara Y, Kurashima N, Makino Y, Nagano T, Sanuki K, Urano Y. **Use of stable isotope ratios for profiling of industrial ephedrine samples: application of hydrogen isotope ratios in combination with carbon and nitrogen.** Forensic Science International 2009;189(1-3):14-18. [Editor's Notes: The utility of hydrogen stable isotope ratio measurement by IR-MS for establishing the origin of ephedrine and pseudoephedrine (ephedrines), and precursors of methamphetamine, was evaluated. Contact: Central Customs Laboratory, Ministry of Finance, 6-3-5 Kashiwanoha, Kashiwa-shi, Chiba 277-0882, Japan.]
3. Kauppila TJ, Kostianen R, Kotiaho T, Laakkonen UM, Luosujarvi L. **Analysis of street market confiscated drugs by desorption atmospheric pressure photoionization and desorption electrospray ionization coupled with mass spectrometry.** Rapid Communications in Mass Spectrometry 2009;23(9):1401-1404. [Editor's Notes: Results of the title techniques are presented. Contact: Department of Chemistry, Laboratory of Analytical Chemistry, FI-00014 University of Helsinki, Finland.]
4. Man G, Stoeber B, Walus K. **An assessment of sensing technologies for the detection of clandestine methamphetamine drug laboratories.** Forensic Science International 2009;189(1-3):1-13. [Editor's Notes: A review. Contact: Department of Electrical & Computer Engineering, The University of British Columbia, 2332 Main Mall, Vancouver, BC V6T 1Z4, Canada.]

#### **Additional References of Possible Interest:**

1. Accetta G, Bertol E, Biggeri A, Di Padua M, Mari F, Politi L, Trignano C. **Cocaine and heroin in waste water plants: A 1-year study in the city of Florence, Italy.** Forensic Science International 2009;189(1-3):88-92. [Editor's Notes: The use of cocaine and heroin in the city of Florence, Italy, over a 1-yr period was investigated. By using GC-MS, cocaine, benzoylecgonine, and morphine were detected in waste water samples and the amounts estimated. The heroin-to-cocaine use ratio in terms of estimated doses per month showed wider distribution of cocaine than heroin in Florence. Contact: Division of Forensic Toxicology, Department of Anatomy, Histology, and Legal Medicine Viale Morgagni, University of Florence, 85, Florence 50134, Italy.]
2. Went MJ, West MJ. **The spectroscopic detection of drugs of abuse on textile fibres after recovery with adhesive lifters.** Forensic Science International 2009;189(1-3):100-103. [Editor's Notes: This study shows that when fibers are tape lifted, particles of substances present trapped within those fibers are also lifted. The Raman spectra obtained showed that it is possible to identify drugs of abuse from particles trapped within fibers without interference from the fiber itself. Contact: School of Physical Sciences, Ingram Building, University of Kent, Canterbury, Kent CT2 7NH.]

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- SEPTEMBER 2009 -

### OXYCONTIN® MIMIC TABLETS SEIZED IN FLORIDA

The Pinellas County Forensic Laboratory received two separate submissions of suspected oxycodone tablets. The first submission contained four green, round, biconvex tablets (average tablet weight 250 milligrams), and the second submission contained six green, round, biconvex tablets (average tablet weight 300 milligrams) both imprinted with “OC” on one face and “80” on the opposite face. Both tablets were similar in appearance to the 80 milligram OxyContin® tablets (see Photos 1 and 2). However, the first submission was darker in color, thinner and had a larger imprint with wider spacing (right in photos). The second submission was consistent in color and size, but had wider spaced markings (left in photos). Analysis of the first submission (total net mass 1.0 grams) by GC/MS identified no oxycodone, but rather a mixture of melatonin and acetaminophen.

Analysis of the second submission (total net mass 1.8 grams) by TLC, GC/MS, and GC/IRD identified no oxycodone, but rather a mixture of diazepam (not quantitated), orphenadrine, and acetaminophen. These are the first pharmaceutical mimic tablets submitted to this laboratory.



**Photo 1**



**Photo 2**

## MDMA CAPSULES SEIZED IN CALIFORNIA

The Los Angeles Police Department's Scientific Investigation Division Narcotics Analysis Unit received a vial containing 29 clear capsules, each containing a brown crystalline material (total net mass 4.6 grams) (see Photo 3). Also submitted as a separate item was a ziplock bag containing loose brown crystalline material (total net mass 27.4 grams). Additionally, marijuana, cocaine, cocaine base and Ecstasy tablets, as confirmed by analysis, were also seized. Analysis of both brown crystalline submissions by color tests (Wagner's - brown, Marquis - black, Sodium Nitroprusside - blue for secondary amine) and GC/MS (basic extract performed into chloroform) confirmed the presence of MDMA in both samples. The samples were not quantitated but had a high loading based on the TIC. No adulterants were detected in either sample. This is the first submission of MDMA as a brown crystalline material in clear capsules to the laboratory.



**Photo 3**

\* \* \* \* \*

## MDMA MIMIC TABLETS SEIZED IN MICHIGAN



**Photo 4**

The DEA North Central Laboratory recently received three submissions of MDMA mimic tablets: 9 round red-coated tablets (total net mass 2.5 grams), 22 round lime green-coated tablets (total net mass 6.2 grams) (see Photo 4), and 14 round purple-coated tablets (total net mass 4.0 grams), each with a butterfly imprint on both faces. Although the tablets appeared uniform, the coatings were thin and varied in consistency, suggesting that the coatings were illicitly produced. Analysis of the tablets by GC/MS, GC/FID, LC/MS, and UV did not reveal the presence of a controlled substance.

## JWH-073 (PURPORTED “SPICE” INGREDIENT) IN VIRGINIA

The Virginia Department of Forensic Science’s Central Laboratory received a small glass vial containing a light yellow powder. Analysis of the powder (total net mass 0.27 gram) by color tests (Marquis - yellow to brown, Mecke - yellow), TLC, AccuTOF-DART, GC/FID and GC/MS indicated 1-Butyl-3-(1-naphthoyl)indole, also known as JWH-073. JWH-073 is a cannabimimetic indole and is included in the DEA's list of Drugs and Chemicals of Concern. It has been purported to be an ingredient in “Spice” herbal mixtures. This is the laboratory's first encounter with a “Spice” chemical.

[Editor’s Notes: For more information about Spice, see: Microgram Bulletin 2009:42(3):23-24.]

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## OXYCONTIN® MIMIC TABLETS SEIZED IN VIRGINIA

The DEA Mid-Atlantic Laboratory recently received 59 round, green tablets imprinted with “80” on one face and “CDN” on the opposite face, suspected OxyContin®. The tablets (film-coated over a cream-colored interior) averaged 1.0 centimeter in diameter by 0.5 centimeters thick, and weighed approximately 303 milligrams. The tablets were presumptively identified by markings to contain 80 milligrams of oxycodone. Analysis of the tablets (total net mass 17.9 grams) by GC/MS, GC/FID, FTIR-ATR, CE and LC identified not oxycodone, but rather heroin, *l*-ephedrine, *d*-pseudoephedrine and phenylpropanolamine (not quantitated). Tramadol was also presumptively identified as the primary ingredient in the tablets. This is the first known submission of OxyContin® mimic tablets containing heroin, *l*-ephedrine, *d*-pseudoephedrine and phenylpropanolamine to the Mid-Atlantic Laboratory.

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1. Howard C, Gilmore S, Robertson J, Peakall R. **A cannabis sativa STR genotype database for Australian seizures: forensic applications and limitations.** Journal of Forensic Sciences 2009;54(3):556-563. [Editor’s Notes: A genetic database was established with the aim of documenting the genetic diversity of Cannabis sativa in Australia for future utilization in forensic investigations. Contact: School of Botany and Zoology, The Australian National University, Canberra, ACT 0200, Australia.]
2. Jermain JD, Evans HK. **Analyzing Salvia divinorum and its active ingredient salvinorin A utilizing thin layer chromatography and gas chromatography/mass spectrometry.** Journal of Forensic Sciences 2009;54(3):612-616. [Editor’s Notes: Presents results of the subject analyses. Contact: Scientific Investigations Division, San Bernardino County Sheriff's Department, San Bernardino, CA 92415.]

3. Steiner R, Larson R. **Validation of the direct analysis in real time source for use in forensic drug screening.** Journal of Forensic Sciences 2009;54(3):617-622. [Editor's Notes: Validation of a rapid screening technique for drugs of abuse utilizing the direct analysis in real time (DART) ion source coupled to an accurate mass time-of-flight mass spectrometer is presented. Comparison of this technique to established analytical protocols is also presented. Contact: Central Laboratory Drug Analysis section, Virginia Department of Forensic Science, Richmond, VA 23219.]
4. Uchiyama N, Kikura-Hanajiri R, Kawahara N, Goda Y. **Identification of a cannabimimetic indole as a designer drug in a herbal product.** Forensic Toxicology 2009;27(2):61-66. [Editor's Notes: A cannabimimetic indole has been identified as a new adulterant in an herbal product being sold illegally in Japan for its expected narcotic effect. Analysis by LC/MS and GC/MS indicated that the product contained two major compounds. Contact: National Institute of Health Sciences, 1-18-1 Kamiyoga, Setagaya-ku, Tokyo 158-8501, Japan.]
5. Zhang Y, Tobias H, Brenna JT. **Steroid isotopic standards for gas chromatography-combustion isotope ratio mass spectrometry (GCC-IRMS).** Steroids 2009;74(3):369-378. [Editor's Notes: The procedure for the creation of isotopic steroid mixtures resulting in consistent standards with isotope ratios traceable to the relevant international reference material is presented. Contact: Division of Nutritional Sciences, Savage Hall, Cornell University, Ithaca, NY 14853.]

#### Additional References of Possible Interest:

1. Colella M, Parkinson A, Evans T, Lennard C, Roux C. **The recovery of latent fingerprints from evidence exposed to ionizing radiation.** Journal of Forensic Sciences 2009;54(3):583-590. [Contact: Australian Nuclear Science & Technology Organisation, Menai, NSW 2234, Australia.]
2. Silvestre V, Mboula VM, Jouitteau C, Akoka S, Robins RJ, Remaud GS. **Isotopic <sup>13</sup>C NMR spectrometry to assess counterfeiting of active pharmaceutical ingredients: Site-specific <sup>13</sup>C content of aspirin and paracetamol.** Journal of Pharmaceutical and Biomedical Analysis 2009;50(3):336-341. [Editor's Notes: Quantitative isotopic <sup>13</sup>C NMR is shown to be a very promising and effective tool for assessing the counterfeiting of medicines, as exemplified by an analysis of aspirin (acetylsalicylic acid) and paracetamol (acetaminophen) samples collected from pharmacies in different countries. It is proposed as an essential complement to <sup>2</sup>H NMR and IRMS. Contact: Chemistry and Interdisciplinarity: Synthesis, Analysis and Modeling (CEISAM), UMR6230, 2 rue de la Houssiniere, University of Nantes-CNRS, BP 92208, Nantes F-44322, France.]
3. Upreti VV, Eddington ND, Moon KH, Song BJ, Lee IJ. **Drug interaction between ethanol and 3,4-methylenedioxymethamphetamine ("Ecstasy").** Toxicology Letters 2009;188(2):167-172. [Editor's Notes: A case study. Contact: Department of Pharmaceutical Sciences, School of Pharmacy, University of Maryland, Baltimore, MD 21201.]

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# Microgram

## *Bulletin*

**Published by:**

The Drug Enforcement Administration  
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Washington, DC 20537

The U.S. Attorney General has determined that the publication of this periodical is necessary in the transaction of the public business required by the Department of Justice. Information, instructions, and disclaimers are published in the January issues.

- OCTOBER 2009 -

### **DIMETHYLTRYPTAMINE AND ECSTASY MIMIC TABLETS (ACTUALLY CONTAINING 5-METHOXY-METHYLISOPROPYLTRYPTAMINE) IN OREGON**

The Oregon State Police Forensics Lab recently received a multiple exhibit submission including suspected dimethyltryptamine (DMT) and MDMA. Also included in the case were exhibits containing marijuana and heroin. The first exhibit of interest consisted of two bags of tan powder (total net mass 0.27 grams). Analysis of the powder by Marquis, UV, and GC/MS identified DMT (not quantitated, but a high loading based on the TIC). The second exhibit of interest contained 45 round, light green tablets embossed with an alien head logo (total net mass 8.7 grams) (See Photo 1). The green tablets were well made and contained small, tan flecks. Analysis of the tablets using Marquis (green to brown) and GC/MS (methanol extract) yielded not MDMA, but rather 5-methoxy-methylisopropyltryptamine (5-MeO-MiPT) (not quantitated, but a high loading based on the TIC). No additional peaks were present in the chromatogram. This is believed to be the first submission of 5-MeO-MiPT in the state of Oregon.



**Photo 1**

## COCAINE CONCEALED IN AN AUTOMOTIVE DRIVE SHAFT IN NEW YORK



**Photo 2**

The DEA Northeast Laboratory recently received a submission from Immigration and Custom Enforcement consisting of an automotive drive shaft (See Photo 2). White powder was extracted from the drive shaft (See Photos 3 and 4), and analysis of the powder (total net mass 892.6 grams) by FTIR, GC-FID, and GC/MS

confirmed 77% cocaine hydrochloride and phenyltetrahydroimidazothiazole. The laboratory typically receives numerous submissions of cocaine hydrochloride in a variety of containers.



**Photo 3**



**Photo 4**

\* \* \* \* \*

## HYDROCODONE MIMIC TABLETS (ACTUALLY CONTAINING HEROIN) IN MARYLAND

The Maryland State Police Forensic Science Division recently received 33 oval, light blue tablets of suspected hydrocodone. The tablets were in a ziplock plastic bag and were imprinted with “WATSON 540” on one face and a half score on the opposite face (See Photo 5). Presumptive identification of hydrocodone was based upon information obtained from The Drug Identification Bible, 2008 edition. The tablets were not well manufactured, and exhibited a crumbling effect when scraped. Analysis of the tablets by UV, GC/FID, and GC/MS identified not hydrocodone, but rather heroin (not quantitated, but a low loading based on the TIC). The laboratory has received various submissions of manufactured tablets containing hydrocodone, but this was the first submission of hydrocodone mimic tablets that contained heroin.



**Photo 5**

## PHENTERMINE MIMIC TABLETS (ACTUALLY CONTAINING SIBUTRAMINE AND FENFLURAMINE) SEIZED IN FLORIDA

The Florida Department of Law Enforcement Tampa Regional Crime Laboratory received two different cases involving white oval tablets with blue specks. All of the tablets were marked with “A 159” with a half score between the “A” and “159,” and appeared to be legitimate pharmaceutical tablets. The tablets were presumptively identified by the markings to contain 37.5 milligrams of phentermine.

The first case consisted of 90 tablets (total net mass 27.7 grams) submitted as suspected phentermine tablets (See Photos 6 and 7). Analysis of three individual tablets and a combination of five tablets using GC/MS identified sibutramine (not quantitated, but a very low loading based on the TIC). The tablets were tested using four different extractions: methanol, sodium

bicarbonate/chloroform, sodium hydroxide/chloroform, and 0.1 N HCl, which was then made basic with sodium carbonate and extracted into chloroform. Sibutramine is not a controlled substance in the state of Florida.



Photo 6

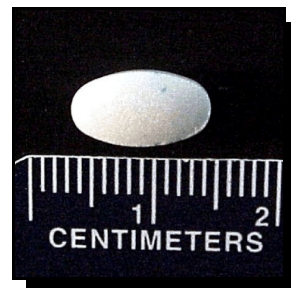


Photo 7

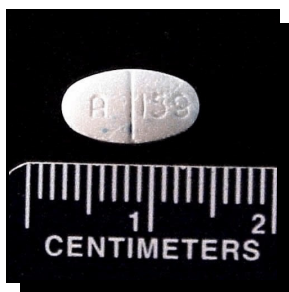


Photo 8

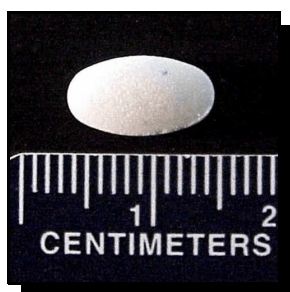


Photo 9

The second case consisted of 2.5 tablets (total net mass 0.6 grams) submitted as suspected amphetamine tablets (See Photos 8 and 9). Analysis of one tablet by GC/MS and GC/FID using a sodium bicarbonate/chloroform extract confirmed the presence of fenfluramine (not quantitated, but a high loading based on the TIC). Fenfluramine is a controlled substance in the state of Florida.

[Editor's Note: Sibutramine and Fenfluramine are listed as Schedule IV controlled substances in Title 21 Code of Federal Regulation (CFR) Part 1308.]

\* \* \* \* \*

## LARGE SEIZURE OF DILUENT CONTAINING QUININE IN GEORGIA

The Georgia Bureau of Investigation Headquarters Laboratory recently received a submission containing 20 large cylindrical bottles containing fine white powder, totaling approximately 10 kilograms. Three bottles were labeled as containing room deodorizer, with the remaining seventeen being unlabelled. Analysis by GC/MS, FTIR, TLC, and UV confirmed the presence of mannitol and quinine (not quantitated, but a moderate loading based on the TIC). Submissions of cutting agents containing quinine are rarely seen by the Georgia Bureau of Investigation Headquarters Laboratory.

## MIMIC ALPRAZOLAM TABLET (ACTUALLY CONTAINING MELATONIN) IN NEW YORK

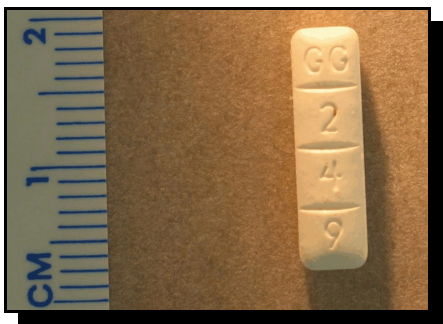


Photo 10

The New York State Police Mid-Hudson Regional Crime Laboratory received a submission containing one rectangular, white tablet imprinted with “GG 249” (See Photo 10). The tablet was presumptively identified by its physical characteristics to contain 2 milligrams of alprazolam. Analysis of the tablet (total net mass 0.38 grams) by GC/MS indicated the tablet contained melatonin (not quantitated, but a moderate loading based on the TIC). This is the first alprazolam mimic tablet this laboratory has received.

[Editor’s Note: Similar appearing “GG 249” mimic tablets were reported earlier this year by the Florida Department of Law Enforcement, Pensacola Regional Operation Center; those tablets contained melatonin or a non-controlled benzodiazepine; see: Microgram Bulletin 2009;42(1):2.]

\* \* \* \* \*

## HEROIN SMUGGLED IN A CHESS BOARD IN NEW YORK

The DEA Northeast Laboratory recently received a chess board (See Photo 11) from United States Customs and Border Protection agents. Analysis of the powder found within the board (total net mass 232.4 grams) by FTIR, GC/MS and GC/FID confirmed 35% heroin (salt form undetermined) and caffeine. The laboratory typically receives numerous submissions of heroin in a variety of containers.



Photo 11

\* \* \* \* \*

## SELECTED REFERENCES

[The Selected References section is a compilation of recent publications of presumed interest to forensic chemists. Unless otherwise stated, all listed citations are published in English. Abbreviated mailing address information duplicates that provided by the abstracting service. Patents and Proceedings are reported only by their *Chemical Abstracts* citation number.]

1. Auwaerter V, Dresen S, Weinmann W, Mueller M, Puetz M, Ferreiros N. **'Spice' and other herbal blends: harmless incense or cannabinoid designer drugs?** Journal of Mass Spectrometry 2009;44(5):832-837. [Editor’s Notes: The herbal blend, Spice, was tested for cannabinoid designer drug content. Contact: Institute of Forensic Medicine, Forensic Toxicology, University Medical Centre Freiburg, 79104 Freiburg, Germany.]



2. Noonan KY, Tonge LA, Fenton OS, Damiano DB, Frederick KA. **Rapid classification of simulated street drug mixtures using Raman spectroscopy and principal component analysis.** *Applied Spectroscopy* 2009;63(7):742-747. [Editor's Notes: Presents the title study. Contact: Department of Chemistry, College of the Holy Cross, Worcester, MA 01610 USA.]
3. Westphal F, Junge T, Roesner P, Soennichsen F, Schuster F. **Mass and NMR spectroscopic characterization of 3,4-methylenedioxypyrovalerone: A designer drug with alpha-pyrrolidinophenone structure.** *Forensic Science International* 2009;190(1-3):1-8. [Editor's Notes: Presents the title study. 3,4-methylenedioxypyrovalerone (MDPV), a drug variant of pyrovalerone, was first seized in Germany in the year 2007. Contact: Sachgebiet Toxikologie/Betaeubungsmittel, Landeskriminalamt Schleswig-Holstein, Muehlenweg 166, Kiel 24116, Germany.]

#### Additional References of Possible Interest:

1. Dujourdy L, Dufey V, Besacier F, Miano N, Marquis R, Lock E, Aalberg L, Dieckmann S, Zrcek F, Bozenko JS. **Drug intelligence based on organic impurities in illicit MA samples.** *Forensic Science International* 2008;177(2-3):153-161. [Editor's Notes: "Collaborative Harmonisation of Methods for Profiling of Amphetamine Type Stimulants" (CHAMP) consisted of the harmonization of a GC/MS method for the analysis of organic impurities found in illicit methamphetamine (MA) samples in a drug intelligence perspective. Statistical analysis provided a selection of pertinent variables among the 43 organic impurities identified in the chromatograms. The organic impurities profiling method was proved to be relevant for the characterization of samples from different seizures and their synthesis route patterns. Contact: Laboratoire Police Scientifique de Lyon, 69134 Ecully, France.]
2. Galesio M, Rial-Otero R, Capelo-Martinez JL. **Comparative study of matrices for their use in the rapid screening of anabolic steroids by matrix-assisted laser desorption/ionization time-of-flight mass spectrometry.** *Rapid Communications in Mass Spectrometry* 2009;23(12):1783-1791. [Editor's Notes: New data on sample preparation and matrix selection for the fast screening of androgenic anabolic steroids (AAS) by matrix-assisted laser desorption/ionization time-of-flight mass spectrometry (MALDI-TOF-MS) is presented. Nine organic and two inorganic matrixes were assessed to determine the best matrix for steroid identification in terms of ionization yield and interference by characteristic matrix ions. The sensitivity achieved by MALDI is comparable with the sensitivity achieved by GC/MS, which is the conventional technique used for AAS detection. Furthermore, the accuracy and precision obtained with MALDI are very good, since an internal mass calibration is performed with the matrix ions. Contact: Departamento de Quimica, Faculdade de Ciencias e Tecnologia, Universidade Nova de Lisboa, Monte de Caparica, Port. 2829-516.]
3. Li F, Song J, Gao D, Zhang Q, Han D, Niu L. **Simple and rapid voltammetric determination of morphine at electrochemically pretreated glassy carbon electrodes.** *Talanta* 2009;79(3):845-850. [Editor's Notes: Presents the title study. Contact: State Key Laboratory of Electroanalytical Chemistry, Changchun Institute of Applied Chemistry, and Graduate University of the Chinese Academy of Sciences, Chinese Academy of Sciences, Changchun, Peop. Rep. China 130022.]

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## THE JOURNAL/TEXTBOOK COLLECTION EXCHANGE

The Journal/Textbook Collection Exchange is a service intended to facilitate the transfer of unwanted journals and textbooks to forensic libraries or other *Microgram* subscribers. At present, this service is offered once a quarter (in January, April, July, and October). The current donations are listed below. The offers are First Come/First Serve (except **libraries have preference**). There are no charges to the requestor. Please provide a full mailing address in the request. **Important!:** Do not provide an address that irradiates mail!

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*Physician's Desk Reference* 2005 Edition

*Physician's Desk Reference* 2004 Edition

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The next offering of journals and textbooks will be in the January 2009 issue of *Microgram Bulletin*.

\* \* \* \* \*

## THE DEA FY 2010 STATE AND LOCAL FORENSIC CHEMISTS SEMINAR SCHEDULE

The FY 2010 schedule for the State and Local Forensic Chemists Seminar is as follows:

March 1-5, 2010

May 31-June 4, 2010

September 13-17, 2010

The school is open only to forensic chemists working for law enforcement agencies. It is intended for chemists who have completed their agency's internal training program and have also been working on the bench for at least one year. There is no tuition charge. The course is held at the Hyatt Place Dulles North Hotel in Sterling, Virginia (near the Washington/Dulles International Airport). A copy of the application form is reproduced on the last page of the August 2004 issue of *Microgram Bulletin* (see: <http://www.dea.gov/programs/forensicsci/microgram/mg0804/aug04.pdf>). Completed applications should be mailed to the Special Testing and Research Laboratory (Attention: J. Head) at: 22624 Dulles Summit Court, Dulles, VA 20166. For additional information, call 703/668-3349.

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# Microgram

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- NOVEMBER 2009 -

### VICODIN MIMIC TABLETS (ACTUALLY CONTAINING DIAZEPAM) IN OHIO

The Toledo Police Department Forensic Laboratory received a submission consisting of heroin and various tablets. One exhibit consisted of eight white, oval tablets of suspected hydrocodone. The tablets had a chalky appearance, and were imprinted with "VICODIN ES" on one face, and a half score on the opposite face (See Photo 1). The eight tablets (total net mass 8.1 grams) averaged 15 millimeters long, 8 millimeters thick, and 10 millimeters wide. Analysis by GC/MS identified not acetaminophen and hydrocodone, but acetaminophen and diazepam (not quantitated, but in an approximate 10:1 ratio based on the TIC). This is the first submission of hydrocodone mimic tablets to the laboratory.



**Photo 1**

## HEROIN AND COCAINE FOUND CONCEALED INSIDE WOODEN COAT HANGERS IN NORTH CAROLINA



**Photo 2**

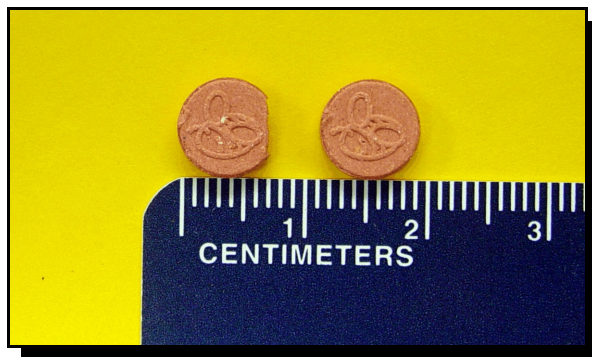
The Charlotte Mecklenburg Police Department (CMPD) Crime Laboratory received eight wooden coat hangers containing powdery material. The hangers were seized by United States Customs and Border Protection personnel after passing through an airport x-ray machine. The hangers were approximately 14 inches in length, constructed of wood with a metal hanger, and contained hidden compartments. Each compartment contained either a white or tan powder wrapped in plastic and carbon paper (See Photo 2). Analysis of the tan powder (total net mass 133.5 grams) by dual column GC/FID/MS and FTIR

confirmed heroin hydrochloride (not quantitated, but a high loading based on the TIC). Analysis of the white powder (total net mass 630.15 grams) by dual column GC/FID/MS and FTIR confirmed cocaine hydrochloride (not quantitated, but a high loading based on the TIC). This was the first submission of cocaine and heroin smuggled in hangers to the CMPD Crime Laboratory.

\* \* \* \* \*

## 4-BROMO-2,5-DIMETHOXYPHENETHYLAMINE (2C-B, “NEXUS”) TABLETS SEIZED IN TENNESSEE

The Tennessee Bureau of Investigation Crime Laboratory received two well made, light red, round, clandestine tablets with a bumblebee logo (See Photo 3). Analysis of these tablets by Marquis (green color), GC/MS, and GC/IR confirmed that the tablets contained 4-bromo-2,5-dimethoxyphenethylamine (2C-B, “Nexus”) (not quantitated, but a high loading based on the TIC). This is the second submission of 2C-B to the laboratory.



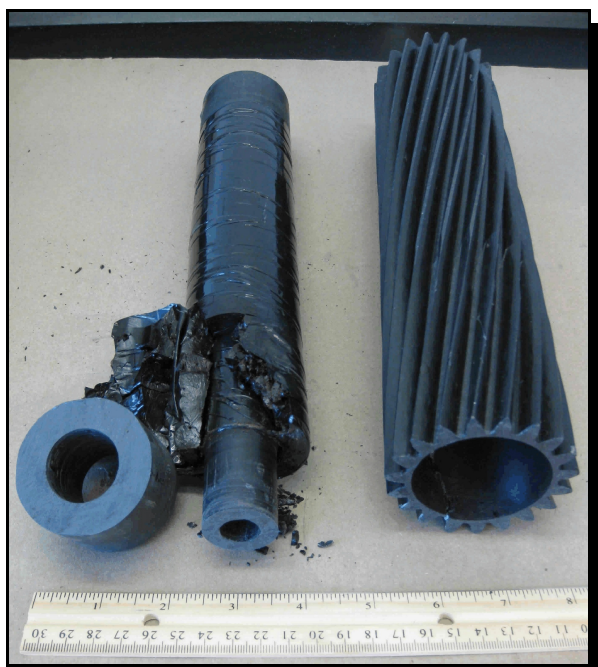
**Photo 3**

## OPIUM CONCEALED IN GEAR-LIKE OBJECTS IN TEXAS



**Photo 4**

The DEA South Central Laboratory received 21 black gear-like objects, each containing a hidden package of a dark brown semi-soft substance (See Photos 4 - 6). The 21 gear-like objects were seized by United States Immigration and Customs Enforcement (ICE) agents. Each package contained 300 to 500 grams of the dark brown semi-soft substance (total net mass of 7,373 grams). Analysis of each package by GC/MS and GC/FID confirmed the presence of codeine, morphine, thebaine, papaverine, and noscapine. This is one of the largest single submissions of opium to this laboratory in recent years.



**Photo 5**



**Photo 6**



## COCAINE SMUGGLED IN LEATHER COVERED BOTTLES IN FLORIDA

The DEA Southeast Laboratory received a submission containing four leather covered bottles from U.S. Immigration and Customs Enforcement (ICE). The four bottles, which originated in Peru, each contained a clear plastic bag of white powder (See Photos 7 - 8). The plastic bags of powder were concealed in the bottom of each bottle. A layer of silicone was used to separate the powder from the rum found in the upper part of the bottle. Analysis of the powder (total net mass 1,014 grams) by GC/FID, GC/MS and FTIR confirmed 91% cocaine hydrochloride. The laboratory typically receives submissions of cocaine concealed in a variety of containers.



Photo 7



Photo 8

\* \* \* \* \*

## CANDY CONTAINING STANOZOLOL



Photo 9

The DEA Northeast Laboratory received a submission containing 35 pink colored candies suspected of containing a steroid (See Photo 9). Analysis of the candies (total net mass 45.2 grams) by LC/MS, UPLC, and GC/MS confirmed the presence of stanozolol (not quantitated). The laboratory has received numerous submissions of stanozolol, but this is the first submission in which stanozolol was found in candy.

## SELECTED REFERENCES

[The Selected References section is a compilation of recent publications of presumed interest to forensic chemists. Unless otherwise stated, all listed citations are published in English. Abbreviated mailing address information duplicates that provided by the abstracting service. Patents and Proceedings are reported only by their *Chemical Abstracts* citation number.]

1. Auwaerter V. **Structure elucidation of synthetic materials in “Spice.”** *LaborPraxis* 2009;33(6):62-64. [Editor’s Notes: The structure was elucidated of additives in the designer drug “Spice” and other herbal blends. Two nonclassical cannabinoids, CP-47,497 and the homolog CP-47,497-C8, and 2 other cannabinoids (aminoalkylindoles), JWH-018 and JWH-073, were identified in Spice variants. Cannabimimetic activity, toxicity, and health risk are discussed of the synthetic additives. Contact: Institut fuer Rechtsmedizin, Universitaetsklinikum Freiburg, D-79104 Freiburg, Germany.]
2. Bolck A, Weyermann C, Dujourdy L, Esseiva P, van den Berg J. **Different likelihood ratio approaches to evaluate the strength of evidence of MDMA tablet comparisons.** *Forensic Science International* 2009;191(1-3):42-51. [Editor’s Notes: Two likelihood ratio approaches are presented to evaluate the strength of evidence of MDMA tablet comparisons. In this paper, the methods and their results are discussed, considering their performance in evidence evaluation and several practical aspects. Contact: Netherlands Forensic Institute, The Hague 2490 AA, Netherlands.]
3. Brandt SD, Martins CPB, Freeman S, Dempster N, Riby PG, Gartz J, Alder JF. **Halogenated solvent interactions with N,N-dimethyltryptamine: Formation of quaternary ammonium salts and their artificially induced rearrangements during analysis.** *Forensic Science International* 2008;178(2-3):162-170. [Editor’s Notes: This research has confirmed that DMT reacts with dichloromethane (DCM) to give a quaternary N-chloromethyl ammonium salt. Furthermore, this was observed to undergo rearrangement during analysis using gas chromatography/mass spectrometry (GC/MS) with products including 3-(2-chloroethyl)indole and 2-methyltetrahydro-beta-carboline (2-Me-THBC). This study further investigates this so far unexplored area of solvent interactions by the exposure of DMT to other halogenated solvents including dibromomethane and 1,2-dichloroethane (DCE). The presence of potentially characteristic marker molecules may allow the identification of solvents used during the manufacture of controlled substances, which is often neglected since these are considered inert. Contact: Institute for Health Research, School of Pharmacy and Chemistry, Liverpool John Moores University, Liverpool, UK L3 3AF]
4. Inoue H, Hashimoto H, Watanabe S, Iwata YT, Kanamori T, Miyaguchi H, Tsujikawa K, Kuwayama K, Tachi N, Uetake N. **Thermal desorption counter-flow introduction atmospheric pressure chemical ionization for direct mass spectrometry of ecstasy tablets.** *Journal of Mass Spectrometry* 2009;44(9):1300-1307. [Editor’s Notes: A novel approach to the analysis of ecstasy tablets by direct mass spectrometry coupled with thermal desorption (TD) and counter-flow introduction atmospheric pressure chemical ionization (CFI-APCI) is described. The method required neither sample pretreatment nor a chromatographic separation step. The effectiveness of the combination of TD and CFI-APCI was demonstrated by application to the direct mass spectrometric analysis of ecstasy tablets and legal pharmaceutical products. Contact: National Research Institute of Police Science, 6-3-1 Kashiwanoha, Kashiwa, Chiba 277-0882, Japan.]
5. Lanzarotta A, Baumann L, Story GM, Witkowski MR, Khan F, Sommers A, Sommer AJ. **Rapid molecular imaging using attenuated total internal reflection planar array infrared spectroscopy for the analysis of counterfeit pharmaceutical tablets.** *Applied Spectroscopy* 2009;63(9):979-991. [Editor’s Notes: A planar array IR spectrograph containing an ATR accessory has been constructed in order to permit rapid analysis of poorly transmitting materials.]

The technique has been optimized to allow molecular spectroscopic information to be collected in roughly 2 seconds with a corresponding peak-to-peak noise value as low as  $2.14 \times 10^{-4}$  absorbance units. The feasibility of this system was demonstrated for the rapid authentication of suspected counterfeit pharmaceutical tablets. Contact: Molecular Microspectroscopy Laboratory, Department of Chemistry and Biochemistry, Miami University, Oxford, OH 45056, USA.]

6. Lindigkeit R, Boehme A, Eiserloh I, Luebbecke M, Wiggermann M, Ernst L, Beuerle T. **Spice: A never ending story?** Forensic Science International 2009;191(1-3):58-63. [Editor's Notes: Several potentially interesting alkylaminoindoles were synthesized (alkylchain C<sub>3</sub> to C<sub>7</sub>). CP 47,497-C8 was isolated from "Spice Gold." These compounds were purified and characterized by NMR and mass spectrometry methods. With the aid of these authentic references we were able to detect and quantify added psychoactive compounds in different herbal blends. Four weeks after Germany's prohibition of several non-traditional cannabinoids, JWH-018 was replaced with its non-regulated C<sub>4</sub>-homolog JWH-073 in some of the acquired herbal blends. The data and method presented here will facilitate and accelerate the detection of these compounds in complex matrixes. Contact: Institute of Pharmaceutical Biology, Braunschweig University of Technology, Braunschweig 38106, Germany.]

#### Additional References of Possible Interest:

1. Florian R. NM, Parada A. F, Garzon M. WF. **Study of cannabinoid content in marihuana samples (Cannabis sativa L.) cultivated in several regions of Colombia.** Vitae 2009;16(2):237-244. [Editor's Notes: Presents title study. Contact: Laboratorio del Area Cientifica, Grupo de Criminalistica, Departamento Administrativo de Seguridad-DAS, Bogota, Colombia.]
2. Garzon M. WF, Parada A. F, Florian R. NM. **Forensic analysis of cocaine samples produced in Colombia: I. Chromatographic profiling.** Vitae 2009;16(2):228-236. [Editor's Notes: Presents title study. Contact: Laboratorio de Quimica de la Division Criminalistica, Fiscalia General de la Nacion, Bogota, Colombia.]
3. Melucci D, Monti D, D'Elia M, Luciano G. **Multivariate analysis of powder drugs using reflectance NIR spectrometry.** Chimica e l'Industria 2009;91(4):83-89. [Editor's Notes: Presents the title study. Contact: Dipartimento di Chimica "G. Ciamician," Universita di Bologna, Italy.]
4. Polli JE, Hoag SW, Flank S. **Near-infrared spectrophotometric comparison of authentic and suspect pharmaceuticals.** Pharmaceutical Technology 2009;33(8):46-52. [Editor's Notes: The authors applied NIR to assess whether eight drug products were authentic or counterfeit. The authors concluded that NIR is a viable method for this application. To minimize incorrect NIR-based conclusions about products, the authors caution that NIR spectra should be analyzed with care because products from various sources may have different formulations and still be legitimate. Contact: University of Maryland School of Pharmacy, Baltimore, MD 21201, USA.]
5. Romero GM, Chianella I, Piletska EV, Karim K, Turner APF, Piletsky SA. **Development of a piezoelectric sensor for the detection of methamphetamine.** Analyst (Cambridge, United Kingdom) 2009;134(8):1565-1570. [Editor's Notes: A computationally designed molecularly imprinted polymer specific for methamphetamine was used as a synthetic receptor for the development of a piezoelectric sensor. Contact: Cranfield Health, Cranfield University, Bedfordshire, UK MK43 0AL.]



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## *Bulletin*

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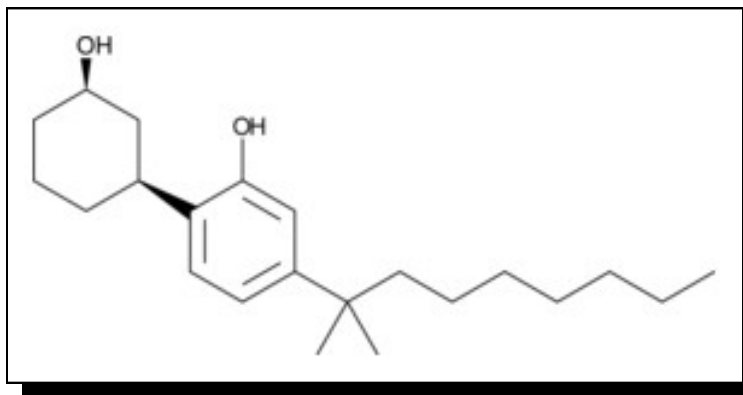
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- DECEMBER 2009 -

### CP-47,497 SEIZED IN WISCONSIN

The Wisconsin State Crime Laboratory received a submission of fine white powder, suspected cocaine or methamphetamine. Analysis of the powder (total net mass 11 milligrams) by Marquis (orange), Meckes (dark green), and GC/MS confirmed the presence of 2-[(1R,3S)-3-hydroxy-cyclohexyl]-5-(2-methylnonan-2-yl)phenol (See Figure 1), the 1,1-dimethyloctyl homologue of CP-47,497 (not quantitated, but a high loading based on the TIC). This is the first submission of a synthetic cannabinoid to the Wisconsin State Crime Laboratory.



**Figure 1**

[Editor's Note: Many European nations have controlled CP-47,497 and its C6, C8, and C9 homologues. The C8 homologue is the main active ingredient found in many "Spice" products.]

## COCAINE IN METALLIC ROLLERS FOR PASTA MACHINE SEIZED IN ITALY



**Photo 1**

The Laboratorio Indagini Chimiche of the Interregional Forensic Science Police Laboratories received four aluminum rollers containing compressed off-white powder, suspected cocaine (See Photos 1 - 3). The exhibits were seized at Naples International Airport by the Guardia di Finanza. The rollers were part of a machine used to make alimentary pasta. Analysis of the powder (total net mass 3,000 grams) by Scott's test, GC/MS, and GC/FID confirmed 36% cocaine (salt form undetermined), caffeine, lidocaine, and levamisole. This was the first seizure of cocaine smuggled in this way and submitted to the Polizia Scientifica Laboratory System in Italy.



**Photo 2**



**Photo 3**



## TEDDY BEAR STUFFED WITH MUSHROOMS IN FLORIDA



Photo 4

The Palm Beach County Sheriff's Office (PBSO) Crime Laboratory received a box containing a white teddy bear stuffed with suspected *Psilocybe* mushrooms. Upon inspection, it was discovered that a seam on the teddy bear had been altered (See Photo 4). The seam was cut open, and inside the white teddy bear were 11 ziplock plastic bags containing dried brown mushrooms (See Photos 5 - 6) (total gross mass 159.57 grams). Analysis of one of the 11 bags (net mass 28.20 grams) by GC/FID and GC/MS confirmed the presence of psilocin in the mushrooms (not quantitated, but a high concentration based on the TIC). This is the first instance of a controlled substance concealed in a teddy bear submitted to the PBSO Crime Laboratory.



Photo 5



Photo 6

\* \* \* \* \*

## COCAINE IN ORANGE ORBS AT JOHN F. KENNEDY INTERNATIONAL AIRPORT

The DEA Northeast Laboratory recently sampled a shipment of 96 orange orbs (See Photo 7) at John F. Kennedy International Airport. Twenty-five of the orbs were submitted to the Northeast Laboratory and were suspected to contain cocaine. Each orb contained a plastic bag of white substance. Analysis of the substance found within the orbs by FTIR, GC/MS, and GC/FID indicated 72.5% cocaine hydrochloride and phenyltetrahydroimidazothiazole

hydrochloride. The laboratory routinely receives cocaine hydrochloride samples in various containers, but this is the first time that cocaine has been received in sealed plastic orbs.



**Photo 7**

\* \* \* \* \*

### **HASHISH CONCEALED INSIDE WICKER BASKETS AND PLACEMATS**

The Charlotte Mecklenburg Police Department (CMPD) Crime Laboratory received three wicker baskets and four wicker placemats. The baskets and placemats contained a



**Photo 9**

total of 25 rope-like strands of black electrical tape, broken out into two-foot sections, each containing a brown, sticky substance



**Photo 8**

encased in plastic wrap (See Photos 8 - 10). Each strand contained an average of 51.96 grams (total net mass 1229.04 grams of material). Analysis of the material by dual column GC/FID/MS confirmed that the substance contained  $\Delta^9$ -tetrahydrocannabinol (THC) (not quantitated, but high loading based on the TIC). This was the first

submission of hashish smuggled in wicker objects to the CMPD Crime Laboratory.



**Photo 10**



## **“SWEET” MARIJUANA**

The DEA Southwest Laboratory received a submission of suspected marijuana. The exhibit was a representative sample from a larger seizure (total net mass 44.05 kilograms) of suspected marijuana. The exhibit was contained within a plastic sugar bag wrapped in an outer layer of cellophane (See Photo 11).



**Photo 11**

Upon analysis of the exhibit, it was found to be primarily composed of “wet” sugar crystals (identified as sucrose via FTIR) with small quantities of green plant material (See Photo 12). Analysis by microscopic examination, GC/MS, and Duquenos-Levine color test confirmed that the plant material was marijuana. The laboratory has received two other similar submissions [Microgram Bulletin 2009;42(8):69].



**Photo 12**

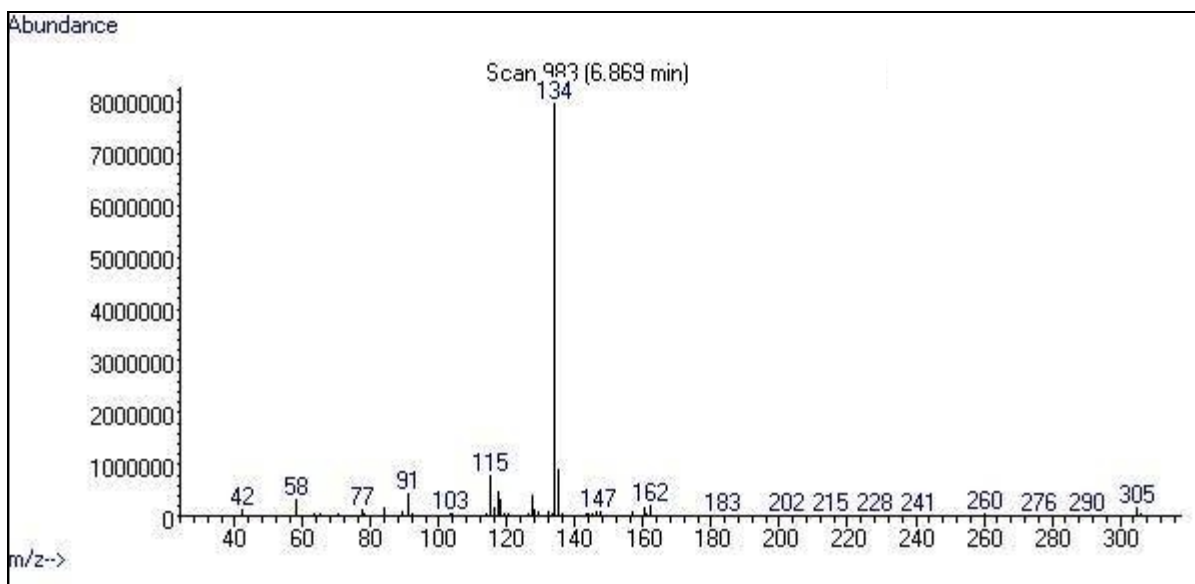
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## **ECSTASY MIMIC TABLETS (ACTUALLY CONTAINING TRIFLUOROMETHYLPHENYLPIPERAZINE AND DAPOXETINE) IN ALABAMA**

The Alabama Department of Forensic Sciences Auburn Laboratory (Auburn, Alabama) analyzed several submissions consisting of blue and orange tablets, both with a star imprint (See Photo 13). Analysis of the tablets by GC/MS and GC/FID identified trifluoromethylphenylpiperazine (TFMPP) and an unknown, later identified as dapoxetine (See Figure 2 for mass spectrum). Dapoxetine is found in Priligy tablets. Priligy is approved for use in some European countries, but has not been approved for use in the United States. TFMPP tablets with dapoxetine have been seen by several different laboratories in Alabama.



**Photo 13**

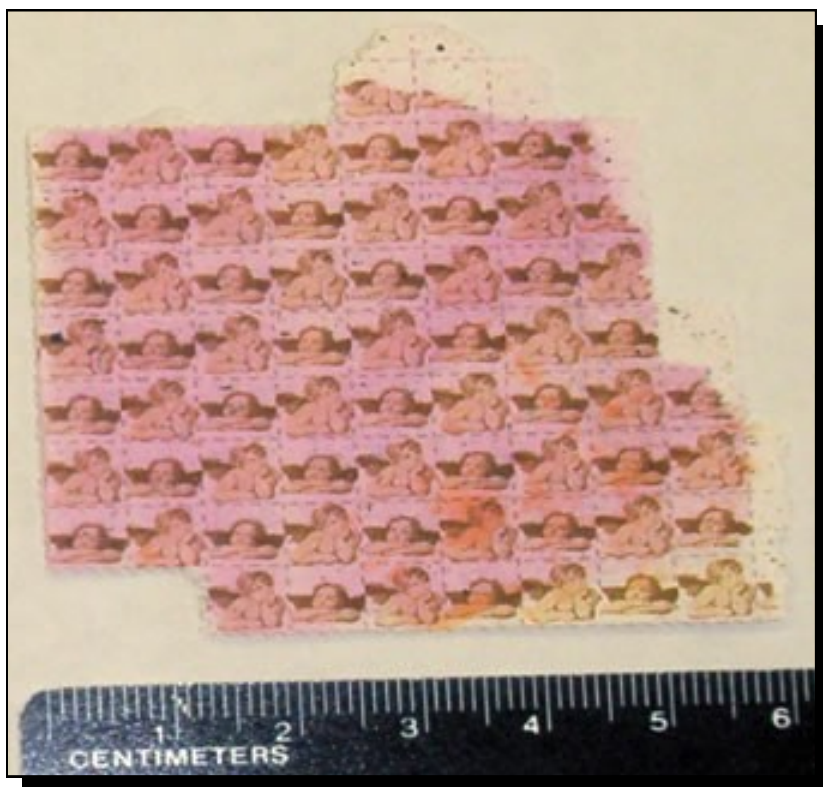


**Figure 2**

\* \* \* \* \*

### **BLOTTER ACID MIMIC (ACTUALLY CONTAINING PHENAZEPAM) IN NORTH CAROLINA**

The North Carolina State Bureau of Investigation Crime Laboratory recently received a submission of suspected LSD. The submission consisted of one sheet of paper that was perforated into 72 squares (total net mass 0.63 grams). Each square was approximately 0.5 centimeters by 0.5 centimeters, and had a print of an angel on each square (See Photo 14). There were two different poses of the angel that alternated from one square to the next. Most of the squares were a purple color, while a few were white. Analysis of two squares by *p*-dimethylaminobenzaldehyde (PDMAB) (negative), and GC/MS indicated phenazepam (a benzodiazepine). This is the first submission to the Raleigh crime laboratory of phenazepam on LSD mimic blotter paper.



**Photo 14**



## SELECTED REFERENCES

[The Selected References section is a compilation of recent publications of presumed interest to forensic chemists. Unless otherwise stated, all listed citations are published in English. Abbreviated mailing address information duplicates that provided by the abstracting service. Patents and Proceedings are reported only by their *Chemical Abstracts* citation number.]

1. Blachut D, Wojtasiewicz K, Czarnocki Z, Szukalski B. **The analytical profile of some 4-methylthioamphetamine (4-MTA) homologues.** *Forensic Science International* 2009;192(1-3):98-114. [Editor's Notes: Several homologues of 4-methylthioamphetamine (4-MTA), a sulfur containing amphetamine type stimulant, were synthesized and characterized by GC/MS, IR, and NMR. GC/MS analysis of their trifluoroacetyl (TFA), pentafluoropropionyl (PFP) and heptafluorobutyryl (HFB) derivatives were also performed. Contact: Internal Security Agency, Forensic Laboratory, 1 Sierpnia 30A, Warsaw 02-134, Poland.]
2. Maher M, Awad T, DeRuiter J, Clark CR. **GC/MS and GC/IRD studies on dimethoxyamphetamines (DMA): Regioisomers related to 2,5-DMA.** *Forensic Science International* 2009;192(1-3):115-125. [Editor's Notes: Presents title study. Contact: Department of Pharmaceutical Analytical Chemistry, Alexandria University, Alexandria 21521, Egypt.]
3. Martin AN, Farquar GR, Steele PT, Jones AD, Frank M. **Use of single particle aerosol mass spectrometry for the automated nondestructive identification of drugs in multicomponent samples.** *Analytical Chemistry* 2009;81(22):9336-9642. [Editor's Notes: Single particle aerosol mass spectrometry (SPAMS) was used to identify the active drug ingredients in samples of multicomponent over-the-counter (OTC) drug tablets with minimal damage to the tablets. This work demonstrates the ability of the SPAMS technique to detect target drug compounds both in complex multi-drug tablets, and multi-tablet sampling sources. The technique is practically nondestructive, leaving the characteristic shape, color, and imprint of a tablet intact for further analysis. Applications of this technique may include forensic and pharmaceutical analysis. Contact: Lawrence Livermore National Laboratory, Livermore, CA 94550, USA.]
4. Sakamoto T, Fujimaki Y, Kawanishi T, Hiyama Y. **An approach for qualitative analysis of pharmaceuticals using diffusion reflectance NIR spectroscopy.** *Iyakuhin Kenkyu* 2009;40(7):387-401. [Editor's Notes: Qualitative evaluation of pharmaceuticals on the market by means of diffuse reflectance NIR spectroscopy was examined. Contact: Division of Drugs, National Institute of Health Sciences 1-18-1, Kamiyoga, Setagaya-ku, Tokyo 158-8501, Japan.]

### Additional References of Possible Interest:

1. Acikkol M, Mercan S, Karadayi S. **Simultaneous determination of benzodiazepines and ketamine from alcoholic and nonalcoholic beverages by GC/MS in drug facilitated crimes.** *Chromatographia* 2009;70(7-8):1295-1298. [Editor's Notes: A GC/MS method was developed for the simultaneous determination of underivatized flunitrazepam, clonazepam, alprazolam, diazepam, and ketamine from drinks by extraction with chloroform:isopropanol 1:1 (v/v). The reported method was sensitive, rapid, and suitable for the analysis of the spiked drinks. Contact: Institute of Forensic Sciences, Istanbul University, Istanbul 34303, Turkey.]
2. Gates K, Chang N, Dilek I, Jian H, Pogue S, Sreenivasan U. **The uncertainty of reference standards - A guide to understanding factors impacting uncertainty, uncertainty calculations, and vendor certifications.** *Journal of Analytical Toxicology* 2009;33(8):532-539. [Editor's Notes: Discusses various uncertainty issues in the context of ISO/IEC 17205]

requirements. Contact: Cerilliant Corporation, 811 Paloma Dr., Ste. A, Round Rock, TX 78665, USA.]

3. Smith JP, Martin A, Sammons DL, Striley C, Biagini R, Quinn J, Cope R, Snawder JE. **Measurement of methamphetamine on surfaces using surface plasmon resonance.** Toxicology Mechanisms and Methods 2009;19(6-7):416-421. [Editor's Notes: This study performed a feasibility study on the use of a surface plasmon resonance (SPR) based instrument in the evaluation of surface contamination by methamphetamine. The instrument is sensitive enough for use for measurement of methamphetamine on surfaces, so it is a candidate for a field method for methamphetamine surface contamination. Contact: Biomonitoring Research Team, Biomonitoring and Health Assessment Branch, National Institute for Occupational Safety and Health, Cincinnati, OH USA.]

\* \* \* \* \*

### Microgram email Address Change

Effective January 1st, 2010 the email address for the *Microgram* Editor will be:

[DEA-Microgram-2010 -at- mailsnare.net](mailto:DEA-Microgram-2010-at-mailsnare.net) (Replace “-at-” with “@”)

The current email address ( [DEA-Microgram-2009 -at- mailsnare.net](mailto:DEA-Microgram-2009-at-mailsnare.net) ) will be monitored until January 31st, 2010. An automated response will direct senders to the new address until April 1st, 2010, at which point the account will lapse.

Important Notes to All Subscribers: All subscribers with filters on their accounts should immediately “whitelist” the [DEA-Microgram-2010 -at- mailsnare.net](mailto:DEA-Microgram-2010-at-mailsnare.net) email address. In addition, it is recommended that the current and previous email addresses used for *Microgram* ( [DEA-Microgram-2009 -at- mailsnare.net](mailto:DEA-Microgram-2009-at-mailsnare.net) ) be automatically filtered (blocked) after January 1st, 2010. This address will no longer be used by *Microgram* after this date; therefore, any subsequent emails from any previous *Microgram* email address will be spam.

All subscribers should notify their IT security personnel of all the above changes.

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\* \* \* \* \*



# Microgram

## *Bulletin*

**Published by:**

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Office of Forensic Sciences  
Washington, DC 20537

The U.S. Attorney General has determined that the publication of this periodical is necessary in the transaction of the public business required by the Department of Justice. Information, instruction, and disclaimers are published in the January issues.

- JANUARY 2010 -

**- CHANGES TO *MICROGRAM BULLETIN* POSTING -**

Starting with the January 2010 issue, *Microgram Bulletin* on [www.dea.gov](http://www.dea.gov) will now contain Scheduling Updates, Safety Alerts, Selective References, Meeting Announcements, Employment Opportunities, The Journal/Textbook Collection Exchange, and Training Opportunities. Intelligence Alerts and Briefs will only be found in *Microgram Bulletin LE* (Law Enforcement) edition.

*Microgram Bulletin LE* will be posted on Law Enforcement Online (LEO), [www.leo.gov](http://www.leo.gov) (criteria for membership and applications for membership can be found at [www.leo.gov/membership\\_criteria.pdf](http://www.leo.gov/membership_criteria.pdf) and [www.leo.gov/usrApp.html](http://www.leo.gov/usrApp.html)). LEO is a free, interactive, computer-communications service provided by the FBI. It provides an Internet accessible focal point for electronic Sensitive But Unclassified (SBU) communication and information sharing for the international, federal, state, local, and tribal law enforcement agencies. LEO also supports antiterrorism, intelligence, law enforcement, criminal justice, and public safety communities worldwide.

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## **- SCHEDULING UPDATE -**

[Editor's Preface: The following notice has been edited for *Microgram Bulletin*. See the Federal Register: December 4, 2009 (Volume 74, Number 232) (Rules and Regulations) (Pages 63603-63610) for the complete text of the ruling.]

### **DEPARTMENT OF JUSTICE**

#### **Drug Enforcement Administration**

#### **21 CFR Part 1300**

**[Docket No. DEA-285F] RIN 1117-AB17**

#### **Classification of Three Steroids as Schedule III Anabolic Steroids Under the Controlled Substances Act**

**AGENCY:** Drug Enforcement Administration (DEA), Department of Justice.

**ACTION:** Final rule.

**SUMMARY:** With the issuance of this final rule, the Deputy Administrator of the Drug Enforcement Administration (DEA) classifies the following three steroids as "anabolic steroids" under the Controlled Substances Act (CSA): Boldione, desoxymethyltestosterone, and 19-nor-4,9(10)-androstadienedione. These steroids and their salts, esters, and ethers are schedule III controlled substances subject to the regulatory control provisions of the CSA.

**DATES:** Effective Date: January 4, 2010.

**FOR FURTHER INFORMATION CONTACT:** Christine A. Sannerud, Ph.D., Chief, Drug and Chemical Evaluation Section, Drug Enforcement Administration, 8701 Morrisette Drive, Springfield, VA 22152, (202) 307-7183.

#### **SUPPLEMENTARY INFORMATION:**

##### **I. Background Information**

In a Notice of Proposed Rulemaking (NPRM) (73 FR 22294) published April 25, 2008, the DEA proposed the classification of three steroids as schedule III anabolic steroids under the CSA. These three steroids included boldione, desoxymethyltestosterone, and 19-nor-4,9(10)-androstadienedione. With the publication of this Final Rule, DEA classifies these three steroids as schedule III anabolic steroids. Background information in support of this Final Rule is provided below.

On November 29, 1990, the President signed into law the Anabolic Steroids Control Act of 1990 (Title XIX of Pub. L. 101-647), which became effective February 27, 1991. This law established and regulated anabolic steroids as a class of drugs under schedule III of the CSA. As a result, a new anabolic steroid is not scheduled according to the procedures set out in 21 U.S.C. 811, but can be administratively classified as an anabolic steroid through the rulemaking process by adding the steroid to the regulatory definition of an anabolic steroid in 21 CFR 1300.01(b)(4).

On October 22, 2004, the President signed into law the Anabolic Steroid Control Act of 2004 (Pub. L. 108-358), which became effective on January 20, 2005. Section 2(a) of the Anabolic Steroid Control Act of 2004 amended 21 U.S.C. 802(41)(A) by replacing the existing definition of "anabolic steroid." The Anabolic Steroid Control Act of 2004 classifies a drug or hormonal substance as an anabolic steroid if the following four criteria are met: (A) The substance is chemically related to testosterone; (B) the substance is pharmacologically related to testosterone; (C) the substance is not an estrogen, progestin, or a corticosteroid; and (D) the substance is not dehydroepiandrosterone (DHEA). Any substance that meets the criteria is considered an anabolic steroid and must be listed as a schedule III controlled substance. DEA finds that boldione, desoxymethyltestosterone, and 19-nor-4,9(10)-androstadienedione meet this definition of anabolic steroid and is adding them to the list of

anabolic steroids in 21 CFR 1300.01(b)(4).

Anabolic steroids are a class of drugs with a basic steroid ring structure that produces anabolic and androgenic effects. The prototypical anabolic steroid is testosterone. Anabolic effects include promoting the growth of muscle. The androgenic effects consist of promoting the development of male secondary sexual characteristics such as facial hair, deepening of the voice, and thickening of the skin.

In the United States, only a small number of anabolic steroids are approved for either human or veterinary use. Approved medical uses for anabolic steroids include treatment of androgen deficiency in hypogonadal males, adjunctive therapy to offset protein catabolism associated with prolonged administration of corticosteroids, treatment of delayed puberty in boys, treatment of metastatic breast cancer in women, and treatment of anemia associated with specific diseases (e.g., anemia of chronic renal failure, Fanconi's anemia, and acquired aplastic anemia). However, with the exception of the treatment of male hypogonadism, anabolic steroids are not the first-line treatment due to the availability of other preferred treatment options. DEA is not aware of any legitimate medical use or New Drug Applications (NDA) for the three substances that DEA is classifying as anabolic steroids under the definition set forth under 21 U.S.C. 802(41)(A). Moreover, DEA has not identified any chemical manufacturers currently using these substances as intermediates in their manufacturing process(es).

Adverse effects are associated with the use or abuse of anabolic steroids. These effects depend on several factors (e.g., age, sex, anabolic steroid used, the amount used, and the duration of use). In early adolescence, the use of testosterone and other anabolic steroids that have estrogenic effects can cause premature closure of the growth plates in long bones resulting in a permanently stunted growth. In adolescent boys, anabolic steroid use can cause precocious sexual development. In both girls and women, anabolic steroid use induces permanent physical changes such as deepening of the voice, increased facial and body hair growth, and the lengthening of the clitoris. In men, anabolic steroid use can cause shrinkage of the testicles, decreased sperm count, and sterility. Gynecomastia (i.e., enlargement of the male breast tissue) can develop with the use of those anabolic steroids with estrogenic actions. In both men and women, anabolic steroid use can damage the liver and can cause high cholesterol levels, which may increase the risk of strokes and heart attacks. Furthermore, anabolic steroid use is purported to induce psychological effects such as aggression, increased feelings of hostility, and psychological dependence and addiction. Upon abrupt termination of long-term anabolic steroid use, a withdrawal syndrome may appear including severe depression.

## **II. Evaluation of Statutory Factors for Classification as an Anabolic Steroid**

With the issuance of this Final Rule, DEA is classifying boldione, desoxymethyltestosterone, and 19-nor-4,9(10)-androstadienedione as anabolic steroids under the definition set forth under 21 U.S.C. 802(41)(A). As noted previously, a drug or hormonal substance is classified as an anabolic steroid by meeting the following four definitional requirements: (A) The substance is chemically related to testosterone; (B) the substance is pharmacologically related to testosterone; (C) the substance is not an estrogen, progestin, or a corticosteroid; and (D) the substance is not DHEA.

### *(A) Chemically Related to Testosterone*

To classify a substance as an anabolic steroid, a substance must be chemically related to testosterone. DEA discussed its evaluation of the chemical relationship of boldione, desoxymethyltestosterone, and 19-nor-4,9(10)-androstadienedione in the NPRM published April 25, 2008 (73 FR 22294). A Structure Activity Relationship (SAR) evaluation for each of the substances compared the chemical structure of the steroid to that of testosterone, as substances with a structure similar to that of testosterone are predicted to possess comparable pharmacological and biological activity.

Boldione is also known by the following chemical name: Androsta-1,4-diene-3,17-dione. DEA has determined that the chemical structure of boldione is chemically related to that of testosterone. The chemical structure of boldione differs from testosterone by only the following structural features: A ketone group at carbon 17 and a double bond between the carbon 1 and carbon 2. The human body would be expected to metabolize the ketone group at carbon 17 into a hydroxyl group that is present on testosterone (Payne and Hales, 2004; Peltoketo et al., 1999; Moghrabi and Andersson, 1998). Furthermore, the scientific literature reports that the additional double bond at carbon 1 in boldione does not significantly decrease the anabolic activity of the substance (Vida, 1969). Boldione is an anabolic steroid precursor, being metabolized by the body into boldenone (Galletti and Gardi,

1971; Kim et al., 2006), which is a schedule III anabolic steroid (21 U.S.C. 802(41)(A)(vi)).

Desoxymethyltestosterone (DMT) is also known by the following names: 17[alpha]-Methyl-5[alpha]-androst-2-en-17[beta]-ol; and madol. DEA has determined that the chemical structure of desoxymethyltestosterone is chemically related to testosterone. The chemical structure of desoxymethyltestosterone differs from testosterone by the following four structural features: The lack of a ketone group at the third carbon, a double bond between the second and third carbon, the lack of a double bond between the fourth and fifth carbon, and a methyl group at carbon 17. Each of these four chemical features is known through the scientific literature not to eliminate the anabolic and androgenic activity of the substance (Brueggemeir et al., 2002; Vida, 1969).

19-Nor-4,9(10)-androstadienedione is also known by the following chemical names: 19-Norandrosta-4,9(10)-diene-3,17-dione; and estra-4,9(10)-diene-3,17-dione. DEA has determined that the chemical structure of 19-nor-4,9(10)-androstadienedione is chemically related to testosterone. The chemical structure of 19-nor-4,9(10)-androstadienedione differs from testosterone by the following three structural features: A ketone group at carbon 17, the absence of a methyl group at carbon 19, and a double-bond between carbon 9 and carbon 10. The human body would be expected to metabolize the ketone group at carbon 17 into a hydroxyl group like that present in testosterone (Payne and Hales, 2004; Peltoketo et al., 1999; Moghrabi and Andersson, 1998). Furthermore, the scientific literature reports that both the absence of the methyl group at carbon 19 and the additional double bond in 19-nor-4,9(10)-androstadienedione increase the anabolic activity of the substance (Vida, 1969).

#### *(B) Pharmacologically Related to Testosterone*

A substance must also be pharmacologically related to testosterone (i.e., produce similar biological effects) to be classified as a schedule III anabolic steroid. The pharmacology of a steroid, as related to testosterone, can be established by performing one or more of the following androgenic and anabolic activity assays: Ventral prostate assay, seminal vesicle assay, levator ani assay, testicular atrophy assay, gonadotropin suppression assay, and androgen receptor binding and efficacy assays. These assays are described below.

*Ventral Prostate Assay, Seminal Vesicle Assay, and Levator Ani Assay:* The classic scientific procedure for examining the effects of a steroid as compared to testosterone is to perform the testosterone sensitive assays, ventral prostate assay, seminal vesicle assay, and levator ani assay in rats. Certain male accessory organs (i.e., the ventral prostate, seminal vesicles, and levator ani muscle) specifically need testosterone to grow and remain healthy. Upon the removal of the testes (i.e., castration), the primary endogenous source of testosterone is eliminated causing the atrophy of the ventral prostate, seminal vesicles, and levator ani muscle (Eisenberg et al., 1949; Nelson et al., 1940; Scow, 1952; Wainman and Shipounoff, 1941). Numerous scientific studies have demonstrated the ability of exogenous testosterone administered to rats following castration to maintain the normal weight and size of all three testosterone sensitive tissues (Biskind and Meyer, 1941; Dorfman and Dorfman, 1963; Kincl and Dorfman, 1964; Nelson et al., 1940; Scow, 1952; Wainman and Shipounoff, 1941). Thus, a steroid with testosterone-like activity will also prevent the atrophy of these three testosterone-dependent tissues in castrated rats.

*Testicular Atrophy Assay:* Administering testosterone to non-castrated rats causes a decrease in serum levels of gonadotropins (i.e., luteinizing hormone [LH] and follicle stimulating hormone [FSH]) from normal levels. Gonadotropins are pituitary hormones that affect the size and function of the testes. The suppression of these gonadotropins by excess testosterone results in a significant decrease in the size and weight of the testes (Boris et al., 1970; McEuen et al., 1937; Moore and Price, 1938). Accordingly, a steroid with testosterone-like activity will also significantly diminish the size and weight of the testes.

*Gonadotropin Suppression Assay:* The castration of rats causes a substantial increase in the serum levels of gonadotropins (i.e., LH and FSH) above normal levels due to the removal of the principal source of endogenous testosterone (Gay and Bogdanove, 1969; Swerdloff et al., 1972, 1973; Swerdloff and Walsh, 1973). The administration of testosterone to castrated animals suppresses the increase in the serum levels of gonadotropins (Gay and Bogdanove, 1969; Swerdloff et al., 1972; Swerdloff and Walsh, 1973; Verjans et al., 1974). The administration of anabolic steroids with testosterone-like activity will also prevent this increase in serum levels of LH and FSH.

*Androgen Receptor Binding and Efficacy Assay:* Androgen receptor binding and efficacy assays are also used to



demonstrate that the activity of a steroid is similar to that of testosterone. Testosterone produces its anabolic effects subsequent to binding to and activating the androgen receptor. Different cell-based assays can compare candidate steroids to testosterone for their ability to bind to and activate androgen receptors.

There are several different types of assays used to establish androgen receptor binding and efficacy. In one assay, C3H10T1/2 stem cells express androgen receptors and are used to assess steroids for their ability to bind and activate the androgen receptor (Jasuja et al., 2005a,b; Singh et al., 2003). In these stem cells, the translocation of the androgen receptor to the nucleus of the cell in the presence of the ligand (e.g., testosterone or its active metabolite dihydroxytestosterone) confirms that the ligand bound to the androgen receptor and activated the downstream signaling cascade. When activated, the C3H10T1/2 stem cells differentiate into skeletal muscle cells as demonstrated by the increase in the expression of muscle specific proteins (i.e., myogenic determination transcription factor [MyoD] and myosin heavy chain [MHC]). Another assay uses human breast cancer cells genetically altered to contain a specific reporter gene (e.g., luciferase gene) regulated by androgen receptor activation (Hartig et al., 2002; Wilson et al., 2002). The expression of a bioluminescent protein (e.g., luciferase) signals both androgen receptor binding and activation.

*Results of the Androgenic and Anabolic Activity Assays:* As discussed in the NPRM, in January 2006, DEA reviewed the published scientific literature for pharmacological data on the anabolic and androgenic activity of boldione, desoxymethyltestosterone, and 19-nor-4,9(10)-androstadienedione using the assays described above. As discussed further below, there was sufficient information on the pharmacology of desoxymethyltestosterone in the reviewed scientific literature to determine that desoxymethyltestosterone is pharmacologically related to testosterone (i.e., produces biological effects similar to those of testosterone). However, the published literature contained insufficient pharmacological data to determine whether boldione and 19-nor-4,9(10)-androstadienedione were pharmacologically related to testosterone. Consequently, as discussed further below and in the NPRM, DEA sponsored pharmacological studies involving several different androgenic and anabolic activity assays to generate the data necessary to make this determination.

Androgenic and anabolic activity assay results indicate that boldione, desoxymethyltestosterone, and 19-nor-4,9(10)-androstadienedione have similar pharmacological activity as testosterone.

#### Boldione

DEA sponsored a study \1\ by the Veteran's Administration Puget Sound Health Care System to determine the anabolic and androgenic effects of boldione in intact and castrated rats (Matsumoto and Marck, 2006). The results of these studies were compared to the results of a study by the same laboratory using a similar protocol to characterize the androgenic and anabolic effects of testosterone (Marck et al., 2003). Boldione administered to castrated male rats by silastic capsules implanted under the skin prevented atrophy of the ventral prostate, seminal vesicles, levator ani muscle, and the rise in serum gonadotropin (LH and FSH) associated with castration. Boldione administration also produced testicular atrophy in intact rats. Another DEA sponsored study \2\ at a laboratory at Boston University examined the ability of boldione to bind to the androgen receptor and to cause the differentiation of C3H10T1/2 stem cells into muscle cells (Bhasin, 2005). All of these effects caused by boldione in C3H10T1/2 stem cells were comparable to those of testosterone as established in experiments using the same or similar methodology (Singh et al., 2003). Collectively, the evidence indicates that the pharmacology of boldione is similar to testosterone.

[1\ The study by the Veteran's Administration Puget Sound Health Care System may be found at <http://www.regulations.gov> in the electronic docket associated with this rulemaking. \2\ The study by Boston University may be found at <http://www.regulations.gov> in the electronic docket associated with this rulemaking.]

#### Desoxymethyltestosterone

Desoxymethyltestosterone was administered subcutaneously, orally, or intramuscularly to castrated rats (Dorfman and Kincl, 1963; Kincl and Dorfman, 1964; Nutting et al., 1966). By all three routes of administration, desoxymethyltestosterone prevented the atrophy of ventral prostate, seminal vesicles, and levator ani muscle. Desoxymethyltestosterone also induced the expression of the bioluminescent protein luciferase in CAMA-1 breast cancer cells signaling androgen receptor binding and activation (Ayotte et al., 2006). Collectively, the evidence indicates that the pharmacology of desoxymethyltestosterone is similar to testosterone. 19-Nor-4,9(10)-Androstadienedione

As discussed in the NPRM, DEA sponsored a study \3\ by the Veteran's Administration Puget Sound Health Care

System to determine the anabolic and androgenic effects of 19-nor-4,9(10)-androstadienedione in intact and castrated rats (Matsumoto and Marck, 2006). The results of these studies were compared to the results of a study by the same laboratory using a similar protocol to characterize the androgenic and anabolic effects of testosterone (Marck et al., 2003). 19-Nor-4,9(10)-androstadienedione administered to castrated male rats by silastic capsules implanted under the skin prevented the atrophy of the ventral prostate, seminal vesicles, levator ani muscle, and the rise in serum gonadotropins (LH and FSH) associated with castration. Another DEA sponsored study at a laboratory at Boston University<sup>4</sup> examined the ability of 19-nor-4,9(10)-androstadienedione to bind to the androgen receptor and to cause the differentiation of C3H10T1/2 stem cells into muscle cells (Bhasin, 2005). 19-Nor-4,9(10)-androstadienedione induced the translocation of the androgen receptor to the nucleus of the C3H10T1/2 stem cells, demonstrating binding affinity and efficacy for the androgen receptor. All of these effects caused by 19-nor-4,9(10)-androstadienedione in C3H10T1/2 stem cells were comparable to those of testosterone as established in experiments using the same or similar methodology (Singh et al., 2003). Collectively, the evidence indicates that the pharmacology of 19-nor-4,9(10)-androstadienedione is similar to testosterone.

[3\ The study by the Veteran's Administration Puget Sound Health Care System may be found at <http://www.regulations.gov> in the electronic docket associated with this rulemaking. 4\ The study by Boston University may be found at <http://www.regulations.gov> in the electronic docket associated with this rulemaking.]

#### *(C) Not Estrogens, Progestins, and Corticosteroids*

As discussed in the NPRM, DEA has determined that boldione, desoxymethyltestosterone, and 19-nor-4,9(10)-androstadienedione are unrelated to estrogens, progestins, and corticosteroids. DEA evaluated the SAR for each of the substances. The chemical structure of each substance was compared to that of estrogens, progestins, and corticosteroids because the chemical structure can be related to its pharmacological and biological activity. DEA found that the three substances lacked the necessary chemical structures to impart significant estrogenic activity (e.g., aromatic A ring) (Duax et al., 1988; Jordan et al., 1985; Williams and Stancel, 1996), progestational activity (e.g., 17[beta]-alkyl group) (Williams and Stancel, 1996), or corticosteroidal activity (e.g., 17-ketone group or 11[beta]-hydroxyl group) (Miller et al., 2002).

#### *(D) Not Dehydroepiandrosterone*

Dehydroepiandrosterone, also known as DHEA, is exempt from control as an anabolic steroid by definition (21 U.S.C. 802(41)(A)). Boldione, desoxymethyltestosterone, and 19-nor-4,9(10)-androstadienedione are not dehydroepiandrosterone and are therefore not exempted from control on this basis.

### **III. Comments Received**

[Editor's Note: See the Federal Register for comments received and DEA's response to said comments.]

### **IV. Conclusion and Impact of Final Rule**

#### *Conclusion*

Therefore, based on the above, DEA concludes that boldione, desoxymethyltestosterone, and 19-nor-4,9(10)-androstadienedione meet the CSA definition of "anabolic steroid" because each substance is: (A) Chemically related to testosterone; (B) pharmacologically related to testosterone; (C) not an estrogen, progestin, or a corticosteroid; and (D) not DHEA (21 U.S.C. 802(41)(A)). All anabolic steroids are classified as schedule III controlled substances (21 U.S.C. 812(e) schedule III). Once a substance is determined to be an anabolic steroid, DEA has no discretion regarding the scheduling of these substances. As discussed further below, upon the effective date of this Final Rule all requirements pertaining to controlled substances in schedule III pertain to these three substances.

[Editor's Note: See the Federal Register for Impact of Final Rule.]

#### **List of Subjects in 21 CFR Part 1300**

Chemicals, Drug traffic control.

For the reasons set out above, 21 CFR Part 1300 is amended as follows:

PART 1300--DEFINITIONS

1. The authority citation for part 1300 continues to read as follows:

**Authority:** 21 U.S.C. 802, 821, 829, 871(b), 951, 958(f).

2. Section 1300.01 is amended in paragraph (b)(4) by:

- A. Redesignating paragraphs (b)(4)(xiii) through (b)(4)(lx) as (b)(4)(xiv) through (b)(4)(lxi),
- B. Adding a new paragraph (b)(4)(xiii),
- C. Further redesignating newly designated paragraphs (b)(4)(xvii) through (b)(4)(lxi) as (b)(4)(xviii) through (b)(4)(lxii),
- D. Adding new paragraph (b)(4)(xvii),
- E. Further redesignating newly designated paragraphs (b)(4)(xlvii) through (b)(4)(lxii) as (b)(4)(xlviii) through (b)(4)(lxiii), and

- F. Adding new paragraph (b)(4)(xlvii) to read as follows:

Sec. 1300.01 Definitions relating to controlled substances.

\* \* \* \* \*

(b) \* \* \*

(4) \* \* \*

(xiii) boldione (androsta-1,4-diene-3,17-dione) \* \* \* \* \*

(xvii) desoxymethyltestosterone (17[alpha]-methyl-5[alpha]-androst- 2-en-17[beta]-ol) (a.k.a., madol)

\* \* \* \* \*

(xlvii) 19-nor-4,9(10)-androstadienedione (estra-4,9(10)-diene- 3,17-dione)

\* \* \* \* \*

Dated: November 20, 2009.

**Michele M. Leonhart,**  
*Deputy Administrator.*

**List of References**

[Editor's Note: See the Federal Register for list of references.]

[FR Doc. E9-28572 Filed 12-3-09; 8:45 am]

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## SELECTED REFERENCES

[The Selected References section is a compilation of recent publications of presumed interest to forensic chemists. Unless otherwise stated, all listed citations are published in English. Abbreviated mailing address information duplicates that provided by the abstracting service. Patents and Proceedings are reported only by their *Chemical Abstracts* citation number.]

1. Belal T, Awad T, Clark CR, De Ruiter J. **GC/MS evaluation of a series of acylated derivatives of 3,4-methylenedioxymethamphetamine.** *Journal of Chromatographic Science* 2009;47(5):359-364. [Editor's Notes: The mass spectral properties of the acetyl, propionyl, and butyryl derivatives of 3,4-methylenedioxymethamphetamine (MDMA) all show a base peak at  $m/z$  58, which is the base peak for the underivatized MDMA. All acylated derivatives provide mass spectral information ( $m/z$  162) to identify the three-carbon side chain for MDMA. The perfluoroalkyl amides yield several unique mass spectral fragments for specific identification of MDMA. MS fragmentation pathways are illustrated and validated using analogous deuterated derivatives. Contact: Department of Pharmaceutical Analytical Chemistry, Faculty of Pharmacy, Alexandria University, Alexandria 21521, Egypt.]
2. De Backer B, Debrus B, Lebrun P, Theunis L, Dubois N, Decock L, Verstraete A, Hubert P, Charlier C. **Innovative development and validation of an HPLC/DAD method for the qualitative and quantitative determination of major cannabinoids in cannabis plant material.** *Journal of Chromatography, B: Analytical Technologies in the Biomedical and Life Sciences* 2009;877(32):4115-4124. [Editor's Notes: A simple and accurate HPLC/DAD method was developed for the quantification of major neutral and acidic cannabinoids present in cannabis plant material:  $\Delta^9$ -Tetrahydrocannabinol (THC), THC acid (THCA), cannabidiol (CBD), CBD acid (CBDA), cannabigerol (CBG), CBG acid (CBGA), cannabinol (CBN), and  $\Delta^8$ -tetrahydrocannabinol ( $\Delta^8$ -THC). Contact: Laboratory of Clinical, Forensic and Environmental Toxicology, CIRM, CHU Sart-Tilman, University of Liege, Liege B-4000, Belgium.]
3. McIlhenny EH, Pipkin KE, Standish LJ, Wechkin HA, Strassman R, Barker SA. **Direct analysis of psychoactive tryptamine and harmala alkaloids in the Amazonian botanical medicine ayahuasca by liquid chromatography-electrospray ionization-tandem mass spectrometry.** *Journal of Chromatography, A* 2009;1216(51):8960-8968. [Editor's Notes: A direct injection/liquid chromatography-electrospray ionization-tandem mass spectrometry procedure has been developed for the simultaneous quantitation of 11 compounds potentially found in the increasingly popular Amazonian botanical medicine and religious sacramental beverage ayahuasca. Its application to the analysis of three different ayahuasca preparations is also described. Contact: Department of Comparative Biomedical Sciences, School of Veterinary Medicine, Skip Bertman Drive at River Road, Louisiana State University, Baton Rouge, LA 70803, USA.]

### Additional References of Possible Interest:

1. Pistos C, Karampela S, Papoutsis I, Athanaselis S, Spiliopoulou Ch, Maravelias C. **Investigation of the identification point system adaptation in cocaine, benzoylecgonine and ecgonine methyl ester using a single quadrupole mass spectrometer.** Rapid Communications in Mass Spectrometry 2009;23(23):3772-3780. [Editor's Notes: At present, no official criteria exist for drug identification using single quadrupole mass spectrometers, although the European Union (EU) criteria for compound identification have been adopted. These criteria are evaluated with respect to the confirmation of cocaine and its metabolites by single quadrupole liquid chromatography/mass spectrometry (LC/MS), and problems are highlighted. Contact: Laboratory of Forensic Medicine and Toxicology, Medical School, University of Athens, Athens, Greece.]
2. Schneiders S, Holdermann T, Dahlenburg R. **Comparative analysis of 1-phenyl-2-propanone (P2P), an amphetamine-type stimulant precursor, using stable isotope ratio mass spectrometry presented in part as a poster at the 2nd meeting of the Joint European Stable Isotope User Meeting (JESIUM), Giens, France, September 2008.** Science & Justice 2009;49(2):94-101. [Editor's Notes: 1-Phenyl-2-propanone (P2P) is a commonly used precursor for clandestine production of amphetamine and methamphetamine. The study's aim was to determine the variation of the isotope ratios within precursor samples from one manufacturer and to compare seized samples of unknown sources to these values. The comparison of all seized samples to the data of the samples of one manufacturer revealed considerable differences. Contact: Forensic Science Institute, Unit Central Analytics II (KT 12), Bundeskriminalamt (Federal Criminal Police Office), Wiesbaden D-65173, Germany.]
3. Tsujikawa K, Kuwayama K, Miyaguchi H, Kanamori T, Iwata YT, Inoue H. **Degradation of N-hydroxy-3,4-methylenedioxymethamphetamine in aqueous solution and its prevention.** Forensic Science International 2009;193(1-3):106-111. [Editor's Notes: Presents title study. Contact: National Research Institute of Police Science, 6-3-1, Kashiwanoha, Kashiwa, Chiba 277-0882, Japan.]

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*Physician's Desk Reference* 2008 Edition

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## THE DEA FY 2010 STATE AND LOCAL FORENSIC CHEMISTS SEMINAR SCHEDULE

The FY 2010 schedule for the State and Local Forensic Chemists Seminar is as follows:

March 1-5, 2010  
May 31-June 4, 2010  
September 13-17, 2010

The school is open only to forensic chemists working for law enforcement agencies. It is intended for chemists who have completed their agency's internal training program and have also been working on the bench for at least one year. There is no tuition charge. The course is held at the Hyatt Place Dulles North Hotel in Sterling, Virginia (near the Washington/Dulles International Airport). A copy of the application form is reproduced on the last page of the August 2004 issue of *Microgram Bulletin* (see: <http://www.dea.gov/programs/forensicsci/microgram/mg0804/aug04.pdf>). Completed applications should be mailed to the Special Testing and Research Laboratory (Attention: J. Head).

\* \* \* \* \*

## SCIENTIFIC MEETINGS

**Title:** 2010 Mid-Atlantic Association of Forensic Scientists Annual Meeting  
**Sponsoring Organization:** Mid-Atlantic Association of Forensic Scientists  
**Inclusive Dates:** May 17-21, 2010  
**Location:** Penn State University (State College, PA)  
**Contact Information:** [maafs@comcast.net](mailto:maafs@comcast.net)  
**Website:** [www.maafs.org](http://www.maafs.org)

\* \* \* \* \*

## Microgram email Address Change

Effective January 1st, 2010 the email address for the *Microgram* Editor became:

[DEA-Microgram-2010-at-mailsnare.net](mailto:DEA-Microgram-2010-at-mailsnare.net) (Replace “-at-” with “@”)

The current email address ( [DEA-Microgram-2009-at-mailsnare.net](mailto:DEA-Microgram-2009-at-mailsnare.net) ) will be monitored until January 31st, 2010. An automated response will direct senders to the new address until April 1st, 2010, at which point the account will lapse.



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All subscribers should notify their IT security personnel of all the above changes.

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## **Information and Instructions for *Microgram Bulletin***

### **General Information**

*Microgram Bulletin* and *Microgram Bulletin LE* are monthly newsletters published by the U.S. Drug Enforcement Administration's Office of Forensic Sciences. *Microgram Bulletin* is primarily intended to provide up-to-date content of interest to the forensic community including: Drug Scheduling Updates, Safety Alerts, Selective Literature References, Meeting Announcements, Employment Opportunities, The Journal and Textbook Collection Exchange, and Training Opportunities. *Microgram Bulletin LE* is primarily intended to assist and serve forensic scientists concerned with the detection and analyses of suspected controlled substances for forensic/law enforcement purposes.

### **Access to *Microgram Bulletin* and *Microgram Bulletin LE***

*Microgram Bulletin LE* is posted at [www.leo.gov](http://www.leo.gov) in the DEA Special Interest Group (SIG), the Department of Justice's information exchange website (IDEA). *Microgram Bulletin* is posted at [www.dea.gov](http://www.dea.gov). At this time, *Microgram Bulletin* and *Microgram Bulletin LE* are available only electronically, and require Internet access. Professional scientific and law enforcement personnel may request email notifications when new issues are posted (such notifications are not available to private citizens). The publications themselves are never sent electronically (that is, as attachments). Requests to be added to the email notification list should preferably be submitted via email to the *Microgram* Editor at: [DEA-Microgram-2010 -at- mailsnare.net](mailto:DEA-Microgram-2010@mailsnare.net). Requests can also be mailed to: DEA Headquarters; Attn: Office of Forensic Sciences/ Microgram Editor; 8701 Morrisette Drive; Springfield, VA 22152. All requests to be added to the *Microgram* email notification list should include the following **Standard Contact Information**:

- \* The Full Name and Mailing Address of Submitting Laboratory or Office;
- \* The Full Name, Title (Laboratory Director, Assistant Special Agent in Charge, Librarian, etc.), Phone Number, FAX Number, and Preferred email Address of the Submitting Individual (Note: that (when possible) email notifications are mailed to titles, not names, in order to avoid problems arising from future personnel changes);
- \* If available, the generic email address for the Submitting Laboratory or Office;
- \* If a generic email address is not available, **one** stable email address for a long-term employee, who will be responsible for forwarding *Microgram* information to all of the other employees in the requestor's Office (**Note that only one email address per Office will be honored**).

Requests to be removed from the *Microgram* email notification list, or to change an existing email address, should also be sent to the *Microgram* Editor. Such requests should include all of the pertinent Standard Contact Information detailed above, and also should provide both the previous and the new email addresses.

Email notification requests/changes are usually implemented within six weeks.

#### **Email Notifications** (Additional Comments)

The email notification indicates which issue has been posted, and additional information as appropriate. Note that *Microgram* e-notices will NEVER include any attachments, or any hyperlinks. **This is important, because the Microgram email address is routinely hijacked and used to send spam, very commonly including malicious attachments.** For this reason, all subscribers are urged to have current anti-viral, anti-spyware, and firewall programs in operation. However, in order to ensure that the email notifications are not filtered as spam, the [DEA-Microgram-2010 -at- mailsnare.net](mailto:DEA-Microgram-2010-at-mailsnare.net) email address should be “whitelisted” by the Office’s ISP.

#### **Costs**

Access to *Microgram Bulletin* and *Microgram Bulletin LE* is free.

#### **Submissions to *Microgram Bulletin* and *Microgram Bulletin LE***

*Microgram Bulletin* includes Safety Alerts, Selected Literature References, Meeting Announcements, Employment Opportunities, The Journal/Textbook Collection Exchange, pertinent sections from the Code of Federal Regulations, Columns of topical importance, and similar material of interest to the general forensic community. *Microgram Bulletin LE* will also feature Intelligence Alerts and Briefs in addition to the content found in *Microgram Bulletin*. Explanatory details for most of the above types of submission are detailed below, and typical examples are published in most issues of *Microgram Bulletin* or *Microgram Bulletin LE*.

All submissions must be in English. Although *Microgram Bulletin LE* is classified as law enforcement sensitive, **case sensitive information should not be submitted!** All submissions should, whenever possible, be submitted electronically, as straight email or as an IBM® PC-compatible Microsoft Word® attachment, to: [DEA-Microgram-2010 -at- mailsnare.net](mailto:DEA-Microgram-2010-at-mailsnare.net). *Current* versions of Microsoft Word® (defined as having release dates less than 5 years old) should be utilized. If email submission is not possible, submissions may be mailed to: DEA Headquarters; Attn: Office of Forensic Sciences/Microgram Editor; 8701 Morrisette Drive; Springfield, VA 22152. Hard copy mailings should be accompanied by an electronic version on an IBM® PC-compatible standard CD-R. **Note that diskettes should be mailed in an irradiation-proof protective sleeve, and the mailing envelope should be marked: “Warning - Contains Electronic Media - Do Not Irradiate”.** Note also that mailed submissions may be subject to lengthy handling delays beyond the control of the Office of Forensic Sciences, and electronic media sent through the mail may be destroyed en route by sanitizing procedures, despite protective measures and written warnings. All submissions should include the following **Contact Information:** The Full Name and Address of Submitting Laboratory or Office, and the Full Name, Phone Number, FAX Number, and Preferred email Address of the Submitting Individual.

**Safety Alerts** are urgent communiqués to the *Microgram Bulletin* readership which give notice of a specific safety issue of particular interest to forensic or crime laboratory personnel, or to

law enforcement personnel dealing with controlled substances. They should include a concise synopsis of the incident(s), recommendations (if any), pertinent literature citations (if any are known), and a mechanism for providing feedback (if appropriate).

**Selected Literature References** is a monthly compilation of reference citations of presumed interest to the *Microgram Bulletin* readership, derived from approximately 7,500 scientific periodicals. The focus of the Selected Literature References is the detection and analysis of suspected controlled substances for forensic/law enforcement purposes. References from clinical and toxicological journals are included only if the material is considered to be of high interest to forensic chemists (for example, contains the mass spectra of an unusual substance that is not known to be published elsewhere). Note that citations from obscure periodicals may be missed, and all *Microgram Bulletin* subscribers are invited to submit citations of interest if they do not appear in *Microgram Bulletin* within three months of their publication. Of particular interest are articles from regional forensic science associations that are unlikely to be noted by any abstracting service. Citations should include a summary sentence and the primary author's contact information.

**Meeting Announcements** list upcoming meetings of presumed interest to the *Microgram Bulletin* readership. **In general, only meetings which are dedicated to forensic chemistry/forensic drug analysis or include a subsection so dedicated will be publicized in *Microgram Bulletin*.** Meeting Announcements should include the Formal Title, Sponsoring Organization, Inclusive Dates, Location (City, State, and specific locale), Registration Deadline, Recommended Hotel (include details on special rates and deadlines where applicable), and Contact Individual's Name, Phone Number, and email Address. If available, the URL for the meeting website should also be included in the Announcement.

**Employment Opportunities** lists job announcements of presumed interest to the *Microgram Bulletin* readership. **In general, only jobs with a forensic chemistry/forensic drug analysis focus for Federal, State, or Local Crime Laboratories or Offices will be publicized in *Microgram Bulletin*.** Exceptions may be requested and will be considered on a case-by-case basis (for example, an academic position in a Forensic Chemistry Department). Employment Opportunity announcements should include the Formal Title of the Organization, Formal Title of the Laboratory or Office, Position Title, Laboratory or Office Location (City and State), Salary Range, Opening and Closing Dates, Duties, General Requirements, Specialized Requirements (if any), Application Procedures, and the Contact Individual's Name, Phone Number, email Address, and Mailing Address. If available, the URL for the agency's website, and (if available) the specific URL for the job posting should also be included in the Announcement. Employment Opportunities will typically be posted for 3 consecutive months, but not past the application deadline.

### **The Journal/Textbook Collection Exchange**

If any subscriber is interested in donating any forensic or analytical chemistry journal and/or textbook collection to a fellow subscriber or library, *Microgram Bulletin* is willing to list the offered materials and the associated contact information in a future issue. The general format should follow the example in the January 2003 issue, and should be sent via email to the *Microgram* Editor at: [DEA-Microgram-2010 -at- mailsnare.net](mailto:DEA-Microgram-2010-at-mailsnare.net). Only items for donation (not for sale) will be considered for publication, and donations to libraries should adhere to journal restrictions and/or time limits (if any) on such offers.

**Intelligence Alerts and Briefs** are concise synopses of the physical and chemical characteristics of novel and/or interesting exhibits submitted to law enforcement laboratories involved in the detection and analyses of suspected controlled substances for forensic/law enforcement purposes. Alerts have some unusual aspect, such as a novel drug, an atypical formulation, or a new smuggling technique, whereas Briefs are reports of routine analyses (that is, that confirmed what was suspected/expected).

**Selected Intelligence Briefs** are reprinted (with permission) unclassified intelligence briefs of presumed interest to the *Microgram Bulletin LE* readership that have been previously published in restricted or nonrestricted publications or websites that are also dedicated to the detection and analyses of suspected controlled substances for forensic/law enforcement purposes.

### **Requests for *Microgram* and/or *Microgram Bulletin* Archives, 1967 - 2002**

All issues of *Microgram* (November 1967 - March 2002) and the first nine issues of its successor *Microgram Bulletin* (April - December 2002) were and continue to be **Law Enforcement Restricted** publications, and are therefore (permanently) unavailable to the general public. [Note that this restriction includes requests made under the Freedom of Information (FOI) Act.]

However, the entire collection, individual issues, or individual sections of issues (e.g., specific articles) are available to law enforcement affiliated offices and laboratories. Requests from such offices and laboratories **must be made on official letterhead** and mailed to:

DEA Headquarters  
Attn: Office of Forensic Sciences/*Microgram* Editor  
8701 Morrisette Drive  
Springfield, VA 22152.

Requests will be sent either by CD or in hard copy (photocopy), as appropriate.

Note that requests made via email will not be honored.

\* \* \* \* \*

## **DISCLAIMERS**

- 1) All material published in *Microgram Bulletin*, *Microgram Bulletin LE*, and *Microgram Journal* is reviewed prior to publication. However, the reliability and accuracy of all published information are the responsibility of the respective contributors, and publication in *Microgram Bulletin*, *Microgram Bulletin LE*, and/or *Microgram Journal* implies no endorsement by the United States Department of Justice or the Drug Enforcement Administration.
- 2) Due to the ease of scanning, copying, electronic manipulating, and/or reprinting, only the posted copies of *Microgram Bulletin*, *Microgram Bulletin LE*, and *Microgram Journal* at [www.leo.gov](http://www.leo.gov), the Department of Justice's information exchange website (IDEA), and [www.dea.gov](http://www.dea.gov) are valid. All other copies, whether electronic or hard, are suspect unless verified against the posted versions.

- 3) **WARNING!:** Due to the often lengthy time delays between the actual dates of seizures and their subsequent reporting in *Microgram Bulletin*, *Microgram Bulletin LE*, and/or *Microgram Journal*, and also because of the often wide variety of seizure types with superficially similar physical attributes, published material cannot be utilized to visually identify controlled substances currently circulating in clandestine markets. **The United States Department of Justice and the Drug Enforcement Administration assume no liability for the use or misuse of the information published in *Microgram Bulletin*.**

# Microgram

## *Bulletin*

**Published by:**

The Drug Enforcement Administration  
Office of Forensic Sciences  
Washington, DC 20537

The U.S. Attorney General has determined that the publication of this periodical is necessary in the transaction of the public business required by the Department of Justice. Information, instruction, and disclaimers are published in the January issues.

- FEBRUARY 2010 -

### DEATH OF LABORATORY DIRECTOR VICKIE A. BAILEY



**Vickie A. Bailey**

DEA Southeast Laboratory (Miami, Florida) Director Vickie Bailey, 53, died Tuesday, January 12th in Miramar, Florida of complications from cancer. Vickie had a distinguished 26½ year career in the Office of Forensic Sciences. She became a Forensic Chemist at the DEA Southwest Laboratory (then located in San Diego, California) in 1983. She was promoted to Supervisory Forensic Chemist in 1992, serving in that position at both the DEA South Central Laboratory (Dallas, Texas) and then at the DEA Southeast Laboratory (Miami, Florida). In 1997, she became a Program Manager at DEA Headquarters (Arlington, Virginia), also serving details in the Office of Training and Office of Inspections. She was promoted to Associate Laboratory Director of the DEA Northeast Laboratory (New York, New York) in 2001. She was promoted to Laboratory Director of the DEA Southeast Laboratory (Miami, Florida) in 2005, serving in that position until her death. Vickie had a vivacious and engaging

personality, was well liked by her compatriots, and will be missed. She was interred January 19th in Rome, Georgia, and is survived by her mother and two sisters.



## THOMAS J. JANOVSKY RETIRES

Thomas J. Janovsky, the Deputy Assistant Administrator for DEA's Office of Forensic Sciences, retired in January 2010. Mr. Janovsky started his career in 1974 as a Forensic Chemist at the DEA North Central Laboratory (Chicago, Illinois). During his 35 years of service he held many positions within DEA. He served as a Supervisory Chemist in both the DEA Northeast Laboratory (New York, New York) and the DEA Special Testing and Research Laboratory (then located in McLean, Virginia). He also served as a Program Manager at DEA Headquarters (Arlington, Virginia). In 1995, he became the Laboratory Director of DEA's Southeast Laboratory (Miami, Florida). In 1998, he was promoted to Associate Deputy Assistant Administrator and then became the Deputy Assistant Administrator for the Office of Forensic Sciences in 1999. The DEA Office of Forensic Sciences extends Mr. Janovsky their best wishes for a long, happy, and healthy retirement.



**Thomas J. Janovsky**

\* \* \* \* \*

## SELECTED REFERENCES

[The Selected References section is a compilation of recent publications of presumed interest to forensic chemists. Unless otherwise stated, all listed citations are published in English. Abbreviated mailing address information duplicates that provided by the abstracting service. Patents and Proceedings are reported only by their *Chemical Abstracts* citation number.]

1. Awad T, Belal T, DeRuiter J, Clark, CR. **GC/IRD studies on regioisomeric ring substituted methoxy methyl phenylacetones related to 3,4-methylenedioxy-phenylacetone.** Forensic Science International 2010;194(1-3):39-48. [Editor's Notes: The methoxy methyl phenylacetones share an isobaric relationship (equivalent mass but different elemental composition) to the controlled precursor substance 3,4-methylenedioxyphenylacetone (3,4-methylenedioxyphenyl-2-propanone; 3,4-MDP-2-P). The ten ring substituted methoxy methyl phenylacetones are resolved by capillary gas chromatography on a modified cyclodextrin stationary phase. All ten regioisomeric ketones eluted before the controlled precursor substance 3,4-methylenedioxyphenylacetone. The vapor phase IR spectra generated from the capillary column effluent clearly differentiated 3,4-MDP-2-P from the various methoxy methyl phenylacetones. Additionally, the methoxy methyl phenylacetones provide unique individual IR spectra. IR absorption frequencies and patterns confirmed the relative position of the methoxy-group and the acetone side-chain for the regioisomeric ketones. Contact: Department of Pharmacal Sciences, Harrison School of Pharmacy, 3306B Walker Building, Auburn University, Auburn, AL 36849, USA.]
2. Hargreaves MD, Burnett AD, Munshi T, Cunningham, JE, Linfield EH, Davies AG, Edwards, HGM. **Comparison of near infrared laser excitation wavelengths and its influence on the interrogation of seized drugs-of-abuse by Raman spectroscopy.** Journal of Raman Spectroscopy 2009;40(12):1974-1983. [Editor's Notes: The laser excitation wavelength is an important parameter in obtaining Raman spectra from drugs-

of-abuse. This article compares the effect of near IR wavelengths, 785 nm, using both benchtop and portable instrumentation and benchtop 1064 nm on the Raman spectra of seized drugs-of-abuse, including cocaine hydrochloride, cocaine base, 3,4-methylenedioxymethamphetamine, amphetamine, heroin, and cannabis. The significant benefit of using 1064 nm for the interrogation of this type of sample is highlighted. Contact: Raman Spectroscopy Group, Division of Chemical & Forensic Sciences, School of Life Sciences, University of Bradford, Bradford BD7 1DP.]

3. Tagliaro F, Pascali J, Fanigliulo A, Bortolotti F. **Recent advances in the application of CE to forensic sciences: A update over years 2007-2009.** *Electrophoresis* 2010;31(1):251-259. [Editor's Notes: Presents a summary of published forensic CE applications covering 2007 through the first few months of 2009. Contact: Department of Medicine and Public Health, Section of Forensic Medicine, University of Verona, Verona, Italy.]
4. West JB, Hurley JM, Dudas FO, Ehleringer JR. **The stable isotope ratios of Marijuana. II. Strontium isotopes relate to geographic origin.** *Journal of Forensic Sciences* 2009;54(6):1261-1269. [Editor's Notes: The  $^{87}\text{Sr}/^{86}\text{Sr}$  ratio of marijuana samples grown in 79 counties across the United States was analyzed to determine if a primary geological signal is retained in marijuana, which could therefore be useful for geographical sourcing. The marijuana results were compared with modeled bedrock  $^{87}\text{Sr}/^{86}\text{Sr}$  values based on  $^{87}\text{Rb}$  decay rates and a generalized geological map of the USA. A significant correlation was observed between marijuana  $^{87}\text{Sr}/^{86}\text{Sr}$  and modeled bedrock  $^{87}\text{Sr}/^{86}\text{Sr}$ . Although values clustered near the 1:1 relationship, there was a predominance of possible anomalies, perhaps attributable to carbonate bedrock. A small number of negative anomalies were also observed, which were generally associated with granitic bedrocks. These results suggest that strontium isotopes in marijuana record the geographical origins of marijuana, and that refinement of the base strontium map (or strontium isoscape) and improved understanding of other strontium sources would be productive. Contact: Department of Biology, University of Utah, Salt Lake City, UT 84112, USA.]

#### **Additional References of Possible Interest:**

1. Sugita R, Sasagawa K, Suzuki S. **Illegal route estimation of the seized illicit drug, methamphetamine, by the comparison of striation marks on plastic packaging films.** *Journal of Forensic Sciences* 2009;54(6):1341-1348. [Editor's Notes: It is possible to trace the origin of methamphetamine by analyzing its organic and inorganic impurities and/or byproducts using several methods, such as GC, GC/MS, and inductively coupled plasma-mass spectrometry (ICP-MS). As reported here, one other method includes comparison of the striation lines of polymer sheet layers from packaging using a polarized light method. Other alternative methods include analyzing the heat sealer pattern, layer thickness surface characteristics, and/or components of polymer sheet layers using IR spectroscopy. Several of these alternative methods were used to analyze the origins of 29 packages confiscated from three regions over a 1000 km distance in Japan. Results indicated that packages seized from different regions had some polymer sheet layers which contained striation lines and heat sealer patterns that were similar. Contact: National Research Institute of Police Science, Kashiwa-shi, Chiba 277-0882, Japan.]

2. Trefi S, Gilard V, Balayssac S, Malet-Martino M, Martino R. **The usefulness of 2D DOSY and 3D DOSY-COSY <sup>1</sup>H NMR for mixture analysis: application to genuine and fake formulations of sildenafil (Viagra).** *Magnetic Resonance in Chemistry* 2009;47(S1):S163-S173. [Editor's Notes: Two-dimensional diffusion ordered spectroscopy (DOSY) <sup>1</sup>H NMR is proposed to analyze complex drug mixtures in order to discriminate genuine from fake formulations of sildenafil. The method was applied to the analysis of 17 formulations of sildenafil. DOSY analysis enabled (i) the differentiation of imitations or counterfeit from the authentic formulation, (ii) the detection of sildenafil and/or adulterants, (iii) the detection of various excipients giving a signature of the tablet manufacturer. This study also presents a three-dimensional DOSY-COSY <sup>1</sup>H NMR experiment that provides both virtual separation and structural information. Contact: Groupe de RMN Biomedicale, Laboratoire SPCMIB (UMR CNRS 5068), Universite Paul Sabatier, Toulouse 31062, France.]
3. Westphal F, Roesner P, Junge Th. **Differentiation of regioisomeric ring-substituted fluorophenethylamines with product ion spectrometry.** *Forensic Science International* 2010;194(1-3):53-59. [Editor's Notes: Presents title study. Contact: Sachgebiet Toxikologie/Betaeubungsmittel, Landeskriminalamt Schleswig-Holstein, Muehlenweg 166, Kiel 24116, Germany.]

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## THE JOURNAL/TEXTBOOK COLLECTION EXCHANGE

The Journal/Textbook Collection Exchange is a service intended to facilitate the transfer of unwanted journals and textbooks to forensic libraries or other *Microgram* subscribers. The current donations are listed below. The offers are First Come/First Serve (except **libraries have preference**). There are no charges to the requestor. Please provide a full mailing address in the request. **Important!:** Do not provide an address that irradiates mail!

*Federal Criminal Code and Rules* – 2008 Edition (13 copies)

*Physician's Desk Reference* 2006 Edition

*Physician's Desk Reference* 2007 Edition

*Physician's Desk Reference* 2008 Edition

**All subscribers are encouraged to donate surplus or unwanted items/collections.** Reference texts and long runs of forensic/analytical journals are of particular interest; however, even single issues are worthwhile, and may fill a hole in an existing collection. If interested, please consult the *Microgram* website or contact the *Microgram* Editor for further instructions.

## THE DEA FY 2010 STATE AND LOCAL FORENSIC CHEMISTS SEMINAR SCHEDULE

The FY 2010 schedule for the State and Local Forensic Chemists Seminar is as follows:

May 31-June 4, 2010  
September 13-17, 2010

The school is open only to forensic chemists working for law enforcement agencies. It is intended for chemists who have completed their agency's internal training program and have also been working on the bench for at least one year. There is no tuition charge. The course is held at the Hyatt Place Dulles North Hotel in Sterling, Virginia (near the Washington/Dulles International Airport). A copy of the application form is reproduced on the last page of the August 2004 issue of *Microgram Bulletin* (see: <http://www.dea.gov/programs/forensicsci/microgram/mg0804/aug04.pdf>). Completed applications should be mailed to the Special Testing and Research Laboratory (Attention: J. Head)

\* \* \* \* \*

### SCIENTIFIC MEETINGS

**Title:** 2010 Mid-Atlantic Association of Forensic Scientists Annual Meeting

**Sponsoring Organization:** Mid-Atlantic Association of Forensic Scientists

**Inclusive Dates:** May 17-21, 2010

**Location:** Penn State University (State College, PA)

**Contact Information:** [maafs@comcast.net](mailto:maafs@comcast.net)

**Website:** [www.maafs.org](http://www.maafs.org)

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# Microgram

## *Bulletin*

**Published by:**

The Drug Enforcement Administration  
Office of Forensic Sciences  
Washington, DC 20537

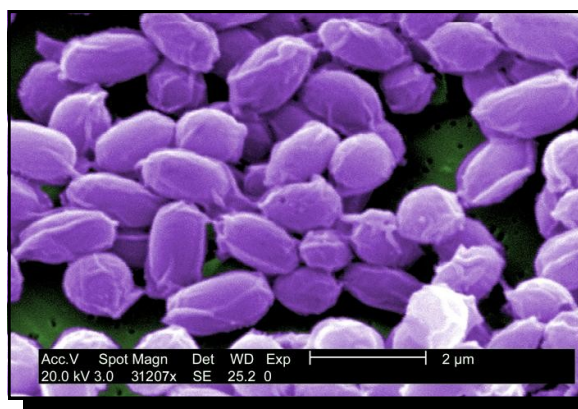
The U.S. Attorney General has determined that the publication of this periodical is necessary in the transaction of the public business required by the Department of Justice. Information, instruction, and disclaimers are published in the January issues.

- MARCH 2010 -

- SAFETY ALERT -

### EUROPEAN HEROIN POSSIBLY CONTAMINATED WITH ANTHRAX

Recent reports have confirmed a number of cases of anthrax infections in heroin users (26 in Scotland, 3 in England, and 1 in Germany), which have resulted in 11 deaths. The first case was confirmed in December 2009. The Centers for Disease Control and Prevention (CDC) classifies anthrax as a Category A bioterrorism agent (highest priority). There are three types of anthrax: cutaneous (skin), gastrointestinal (digestive), and inhalation (lung). Most cases of cutaneous anthrax are curable. Gastrointestinal anthrax is more serious, and between one-fourth and one-half of cases lead to death. Inhalation anthrax is the most severe form of anthrax. In 2001, about half of the inhalation anthrax cases ended in death. No cases of anthrax infection among heroin users have been reported in the United States at this time.



**Anthrax Spores (Courtesy of the CDC)**

[Editor's Note: Information regarding anthrax can be obtained from the CDC's anthrax website: [www.bt.cdc.gov/agent/anthrax](http://www.bt.cdc.gov/agent/anthrax).]

– PROPOSED RULE –

[Editor's Preface: The following notice has been edited for *Microgram Bulletin*. See the Federal Register: February 24, 2010, (Volume 75, Number 36) (Rules and Regulations) (Pages 8287-8292) for the complete text of the proposed rule.]

**DEPARTMENT OF JUSTICE**

**Drug Enforcement Administration**

**21 CFR Part 1310**

**[Docket No. DEA-320P] RIN 1117-AB24**

**Control of Ergocristine, a Chemical Precursor Used in the Illicit Manufacture of Lysergic Acid Diethylamide, as a List I Chemical**

**AGENCY:** Drug Enforcement Administration (DEA), Department of Justice.

**ACTION:** Notice of proposed rulemaking.

**SUMMARY:** The Drug Enforcement Administration (DEA) is proposing to control the chemical precursor ergocristine as a List I chemical under the Controlled Substances Act (CSA). Clandestine laboratories are using this chemical as a substitute for the List I chemicals ergotamine and ergonovine to illicitly manufacture the schedule I controlled substance lysergic acid diethylamide (LSD).

If finalized as proposed, handlers of ergocristine would be subject to the chemical regulatory provisions of the CSA and its implementing regulations, including 21 CFR parts 1309, 1310, 1313, and 1316. This rulemaking does not propose the establishment of a threshold for domestic and international transactions of ergocristine. As such, all transactions involving ergocristine, regardless of size, would be regulated. This rulemaking also proposes to specify that chemical mixtures containing ergocristine will not be exempt from regulatory requirements at any concentration. Therefore, all transactions of chemical mixtures containing any quantity of ergocristine would be regulated and subject to control under the CSA if this rule is finalized as proposed.

**DATES:** Written comments must be postmarked and electronic comments must be submitted on or before April 26, 2010. Commenters should be aware that the electronic Federal Docket Management System will not accept comments after midnight Eastern Time on the last day of the comment period.

**ADDRESSES:** To ensure proper handling of comments, please reference "Docket No. DEA-320P" on all written and electronic correspondence. Written comments sent via regular or express mail should be sent to Drug Enforcement Administration, Attention: DEA Federal Register Representative/ODL, 8701 Morrisette Drive, Springfield, VA 22152. Comments may be sent to DEA by sending an electronic message to [dea.diversion.policy@usdoj.gov](mailto:dea.diversion.policy@usdoj.gov). Comments may also be sent electronically through <http://www.regulations.gov> using the electronic comment form provided on that site. An electronic copy of this document is also available at the <http://www.regulations.gov> Web site. DEA will accept attachments to electronic comments in Microsoft Word, WordPerfect, Adobe PDF, or Excel file formats only. DEA will not accept any file format other than those specifically listed here.

Please note that DEA is requesting that electronic comments be submitted before midnight Eastern Time on the day the comment period closes because <http://www.regulations.gov> terminates the public's ability to submit comments at midnight Eastern time on the day the comment period closes. Commenters in time zones other than Eastern Time may want to consider this so that their electronic comments are received. All comments sent via regular or express mail will be considered timely if postmarked on the day the comment period closes.

**FOR FURTHER INFORMATION CONTACT:** Christine A. Sannerud, PhD, Chief, Drug and Chemical Evaluation Section, Office of Diversion Control, Drug Enforcement Administration, 8701 Morrisette Drive, Springfield, VA 22152; telephone: (202) 307-7183.



## SUPPLEMENTARY INFORMATION:

[Editor's Note: See the Federal Register for information regarding the posting of Public Comments.]

### Background

Lysergic acid diethylamide (LSD) is a synthetic schedule I hallucinogen. It is the most potent hallucinogen known and only microgram amounts are required to produce overt hallucinations. LSD has been abused for its hallucinogenic properties since the 1960s. It induces a heightened awareness of sensory input that is accompanied by an enhanced sense of clarity, but reduced ability to control what is experienced. The LSD "trip" is composed of perceptual and psychic effects. A user may experience the following perceptual effects: Visual distortion in the size and shape of objects, movements, color, sound, touch, and the user's own body image. The user may report "hearing colors" or "seeing sounds." The psychic effects experienced by the user may include feelings of obtaining true insight, intensified emotions, sudden and dramatic mood swings, impairment of attention, concentration and motivation, distortion of time, and depersonalization.

High doses of LSD can induce a "bad trip" characterized by intense anxiety or panic, confusion, and combative behaviors. After a LSD trip, a user may also experience fatigue, acute anxiety, or depression for 12 to 24 hours. LSD is commonly abused by teenagers and young adults in connection with "raves," nightclubs, and concert settings.

LSD is most commonly found in the form of small squares of paper, called blotter, that are generally decorated with artwork or designs, perforated, soaked in liquid LSD solution, and dried. Each square represents one dose of LSD. There have been some instances of blotter paper being found impregnated with hallucinogens other than LSD. For example, the hallucinogens 2,5-dimethoxyamphetamine (DMA) and 4-bromo-2,5-dimethoxyamphetamine (DOB) have been found on blotter paper passed off as LSD.

Other forms of LSD include tablets (known as microdots), gelatin squares (known as window pane), and impregnated sugar cubes. LSD has also been available in gel wraps which look like "bubble-wrap" packing material, and are blue in color. LSD is also distributed in liquid form which often is packaged in small bottles typically sold as breath drops. Additionally, LSD has been embedded in candy such as "Gummy Worms," "Sweet Tarts," "Smarties," and "Pez." The most common venues for retail LSD distribution are "raves," dance clubs, and concerts.

According to the National Forensic Laboratory Information System (NFLIS), Federal, State, and local forensic laboratories analyzed 1,785 and 1,368 exhibits of LSD in 2000 and 2001, respectively. In 2002, the number of LSD exhibits dropped dramatically to 198 due to the seizure of a large clandestine LSD laboratory in Kansas. The number of LSD samples analyzed by Federal, State, and local forensic laboratories remained low for 2003 and 2004 with 362 and 338 LSD exhibits, respectively. However, there appears to be a slight increasing trend seen in 2005, 2006 and 2007, with 521, 590, and 844 exhibits reported, respectively. This trend appears to carry over into 2008 since NFLIS data, entered as of December 29, 2008 already documents 839 LSD exhibits.

### Control Status

Lysergic acid diethylamide is in schedule I of the CSA (21 U.S.C. 812). LSD precursors, lysergic acid and lysergic acid amide, are both schedule III controlled substances (21 U.S.C. 812(b)). The LSD precursors ergotamine and ergonovine are regulated as List I chemicals under the CSA.

### Illicit Production of LSD

LSD has been manufactured illegally since the 1960s. A limited number of chemists, probably less than a dozen, are believed to be manufacturing nearly all of the LSD available in the United States. Clandestine laboratory operators must adhere to precise and complex production procedures, and production of LSD is relatively difficult.

LSD has historically been produced from lysergic acid, which is made from ergotamine or ergonovine, substances derived from an ergot fungus on rye, or from lysergic acid amide, a chemical found in morning glory seeds. Although theoretically possible, manufacture of LSD from morning glory seeds is not economically feasible and these seeds never have been found to be a successful starting material for LSD production. The List I chemicals ergotamine and ergonovine are not widely available in the United States, and their purchase by other than established pharmaceutical firms is suspect. Therefore, ergotamine and/ or ergonovine used in clandestine LSD

laboratories are believed to have been acquired from sources located abroad. Only a small amount of ergotamine or ergonovine is required to produce LSD in large batches. For example, 25 kilograms of ergotamine tartrate can produce five or six kilograms of pure LSD crystal that, under ideal circumstances, could be processed into 100 million dosage units. Thus, clandestine LSD manufacturers need import only a small quantity of precursor material.

#### **Movement to Ergocristine as LSD Precursor and Largest LSD Laboratory Ever Seized by DEA**

Because of the existing CSA regulatory controls on the LSD precursors lysergic acid, lysergic acid amide, ergotamine, and ergonovine, clandestine laboratory operators have sought uncontrolled sources of precursor material for the production of LSD. This has led to the illicit utilization of the precursor chemical ergocristine as a direct substitute for ergotamine and ergonovine for the illicit production of LSD. In fact, the largest clandestine LSD laboratory ever seized by DEA utilized ergocristine as the LSD precursor. Recipes documenting procedures for utilizing ergocristine in LSD synthesis are easily found on the Internet.

In late 2000, in the largest clandestine LSD laboratory seizure ever made by the DEA, agents seized approximately 41.3 kilograms (90.86 pounds) of LSD, manufactured in a clandestine laboratory set up in a missile silo near Wamego, Kansas. On November 6, 2000, two clandestine laboratory operators were moving the illegal laboratory when they were arrested. The clandestine laboratory operators utilized the chemical ergocristine as the unregulated source of precursor material for the production of the LSD. A total of 19 kilograms of ergocristine was seized. According to court testimony, the two defendants previously clandestinely manufactured LSD in Santa Fe, New Mexico, where every five weeks the clandestine laboratory produced about 2.2 pounds of LSD, approximately 10 million doses that cost less than one cent a dose to produce and would sell for as much as \$10 a dose. According to court testimony, the LSD was shipped to California and later to Europe for distribution.

The El Paso Intelligence Center's National Seizure System data show that five clandestine LSD laboratories have been seized since 2001. According to law enforcement reporting, the seized laboratories were operated by a small number of experienced chemists and were of limited capacity: three of which produced less than two ounces, and two of which produced between two and eight ounces per batch.

#### **Availability of the Precursor Chemical**

DEA has determined that ergocristine is readily available from commercial chemical suppliers. DEA has identified at least three suppliers of ergocristine, of which one distributor is located domestically; the other two are based in Germany and the Czech Republic. The ergocristine used by the clandestine laboratory operator arrested in conjunction with the November 2000, clandestine LSD laboratory in Wamego, Kansas, was obtained through a chemical supplier in Germany who obtained the ergocristine from a chemical source firm operating out of the Czech Republic.

In the 2005 International Narcotics Control Board (INCB) report titled "Precursors and Chemicals Frequently Used in the Illicit Manufacture of Narcotic Drugs and Psychotropic Substances," the INCB reported that in response to Czech authorities expression of concern over orders for ergocristine, INCB scrutiny over such shipments led to the one kilogram seizure of ergocristine by Panamanian authorities in early 2005. The INCB further reported that following the seizure, a further order was received from the Netherlands Antilles. The shipment of ergocristine was followed and a clandestine LSD laboratory identified. In that report, the INCB urged governments to exercise vigilance in regard to shipments of ergot alkaloids (such as ergocristine) and related substitutes not under international control.

This rule proposes the addition of both domestic and import/export controls on ergocristine (and its salts). Such controls are deemed necessary for law enforcement to identify domestic and international transactions in ergocristine, due to growing concerns regarding its use for the illicit manufacture of LSD.

#### **Regulation of Ergocristine as a List I Chemical**

The CSA, specifically 21 U.S.C. 802(34) and 21 U.S.C. 802(35), and its implementing regulations at 21 CFR 1310.02(c), provide the Attorney General with the authority to specify, by regulation, additional chemicals as "listed chemicals" if they are used in the manufacture of a controlled substance in violation of the CSA, and are important to the manufacture of the controlled substance. Ergocristine is being used in clandestine laboratories as the precursor material for the illicit manufacture of the schedule I controlled substance LSD. This rule proposes the regulation of ergocristine as a List I chemical because DEA finds that it is used in the illicit manufacture of the controlled substance LSD and is important to the illicit manufacture of the controlled substance LSD.

If finalized as proposed, handlers of ergocristine will become subject to the chemical regulatory provisions of the CSA, including 21 CFR parts 1309, 1310, 1313, and 1316. This rulemaking does not propose the establishment of a threshold for domestic and import transactions of ergocristine pursuant to the provisions of 21 CFR 1310.04 (g). Due to the high potency of LSD, even a single gram (i.e., 1/28th of an ounce) of ergocristine can be used illicitly to make thousands of dosage units of LSD. Therefore, DEA is proposing that all ergocristine transactions, regardless of size, shall be regulated transactions as defined in 21 CFR 1300.02(b)(28). As such, if finalized as proposed, all ergocristine transactions will be subject to recordkeeping, annual manufacturer reporting of inventory and use data, import/export controls, and other CSA chemical regulatory requirements.

#### **Chemical Mixtures Containing Ergocristine**

This rulemaking also proposes that chemical mixtures containing ergocristine not be exempt from regulatory requirements at any concentration, unless an application for exemption of a chemical mixture is submitted by an ergocristine manufacturer and the application is reviewed and accepted by DEA under 21 CFR 1310.13 (Exemption by Application Process). Since even a small amount of ergocristine is able to make a significant amount of LSD, the control of chemical mixtures containing any amount of ergocristine is necessary to prevent the illicit extraction, isolation, and use of the ergocristine. Therefore, all chemical mixtures containing any quantity of ergocristine will be subject to CSA control, if this rule is finalized as proposed, unless the ergocristine manufacturer is granted an exemption by the application process discussed below. If finalized, this proposed rule will modify the Table of Concentration Limits in 21 CFR 1310.12(c) to reflect the fact that chemical mixtures containing any amount of ergocristine are subject to CSA chemical control provisions.

[Editor's Note: See the Federal Register for information regarding the Exemption by Application Process, Requirements for Handling List I Chemicals, and Regulatory Certifications.]

For the reasons set out above, 21 CFR part 1310 is proposed to be amended as follows:

#### **PART 1310--RECORDS AND REPORTS OF LISTED CHEMICALS AND CERTAIN MACHINES**

1. The authority citation for part 1310 continues to read as follows:

Authority: 21 U.S.C. 802, 827(h), 830, 871(b), 890.

2. Section 1310.02 is amended by adding a new paragraph (a)(30) to read as follows:

Sec. 1310.02 Substances covered.

\* \* \* \* \* (a)

\* \* \*

(30) Ergocristine and its salts 8612

\* \* \* \* \*

3. Section 1310.04 is amended by redesignating paragraphs (g)(1)(ii) through (g)(1)(vii) as paragraphs (g)(1)(iii) through (g)(1)(viii), and adding a new paragraph (g)(1)(ii) to read as follows:

Sec. 1310.04 Maintenance of records.

\* \* \* \* \*

(g) \* \* \*

(1) \* \* \*

(ii) Ergocristine and its salts

\* \* \* \* \*

4. Section 1310.09 is amended by adding new paragraph (k) to read as follows:

Sec. 1310.09 Temporary exemption from registration.

\* \* \* \* \*

(k)(1) Each person required under Sections 302 and 1007 of the Act (21 U.S.C. 822, 957) to obtain a registration to manufacture, distribute, import, or export regulated ergocristine and its salts, including regulated chemical mixtures pursuant to Section 1310.12 of this part, is temporarily exempted from the registration requirement, provided that DEA receives a properly completed application for registration or application for exemption for a chemical mixture containing ergocristine and its salts pursuant to Section 1310.13 of this part on or before (30 days after publication of a Final Rule implementing regulations regarding ergocristine). The exemption will remain in effect for each person who has made such

application until the Administration has approved or denied that application. This exemption applies only to registration; all other chemical control requirements set forth in the Act and parts 1309, 1310, 1313, and 1316 of this chapter remain in full force and effect.

(2) Any person who manufactures, distributes, imports or exports a chemical mixture containing ergocristine and its salts whose application for exemption is subsequently denied by DEA must obtain a registration with DEA. A temporary exemption from the registration requirement will also be provided for those persons whose applications for exemption are denied, provided that DEA receives a properly completed application for registration on or before 30 days following the date of official DEA notification that the application for exemption has been denied. The temporary exemption for such persons will remain in effect until DEA takes final action on their registration application.

5. Section 1310.12(c) is amended by adding in alphabetical order an entry "Ergocristine and its salts" in the table "Table of Concentration Limits" to read as follows:

Sec. 1310.12 Exempt chemical mixtures.

**Table of Concentration Limits**

	<b>DEA chemical Code Number</b>	<b>Concentration</b>	<b>Special Conditions</b>
<b>List I Chemicals</b>			
Ergocristine and its salts	8612	Not Exempt at any concentration.	Chemical mixtures containing an amount of ergocristine and its salts are not exempt.

Dated: February 12, 2010.

**Michele M. Leonhart,**  
*Deputy Administrator.*

[FR Doc. 2010-3701 Filed 2-23-10; 8:45 am]  
BILLING CODE 4410-09-P

\* \* \* \* \*

## **SELECTED REFERENCES**

[The Selected References section is a compilation of recent publications of presumed interest to forensic chemists. Unless otherwise stated, all listed citations are published in English. Abbreviated mailing address information duplicates that provided by the abstracting service. Patents and Proceedings are reported only by their *Chemical Abstracts* citation number.]

1. Abdel-Hay KM, Awad T, DeRuiter J, Clark CR. **Differentiation of methylenedioxybenzylpiperazines (MDBP) by GC/IRD and GC/MS.** Forensic Science International 2010;195(1-3):78-85. [Editor's Notes: Presents title study. Contact: Department of Pharmacal Sciences, Harrison School of Pharmacy, Auburn University, Auburn, AL 36849, USA.]
2. Chappell JS, Lee MM. **Cathinone preservation in khat evidence via drying.** Forensic Science International 2010;195(1-3):108-120. [Editor's Note: The primary concern with the forensic analysis of the khat plant (*Catha edulis*) has been the need to preserve the cathinone, which converts to cathine, after harvesting. A common misconception is that cathinone is highly unstable once the plant is harvested, and may

be undetectable upon drying and prolonged storage. However, drying the plant material will preserve cathinone. This study has shown that cathinone persists in dried khat for a time frame of several years, and that simple drying techniques are an effective means to preserve seized khat evidence for long-term storage. Contact: Drug Enforcement Administration, 390 Main Street, Western Laboratory, Room 700, San Francisco, CA 94105, USA.]

3. Kocak A, De Cotiis LM, Hoffman DB. **Comparative study of ATR and transflection IR spectroscopic techniques for the analysis of hallucinogenic mushrooms.** Forensic Science International 2010;195(1-3):36-41. [Editor's Notes: Presents title study. Contact: John Jay College of Criminal Justice, The City University of New York, Department of Sciences, 445 W 59th Street, New York, NY 10019, USA.]
4. Laussmann T, Meier-Giebing S. **Forensic analysis of hallucinogenic mushrooms and khat (Catha edulis) using cation-exchange liquid chromatography.** Forensic Science International 2010;195(1-3):160-164. [Editor's Notes: Presents title study. Contact: Centre for Education and Science of the Federal Finance Administration, Customs Laboratory Cologne, Merianstrasse 110, Cologne 50765, Germany.]

#### Additional References of Possible Interest:

1. Blackmore D, Li J, Ebrahimi D, Collins M, Vujic S, Gavoyannis P. **A probabilistic approach to heroin signatures.** Analytical and Bioanalytical Chemistry 2010;396(2):765-773. [Editor's Notes: The application of the Bayes Theorem to the determination of the geographic origin of heroin signature samples is presented. The analysis of 2549 heroin sample seized at Australia's borders are used to illustrate the method. The results obtained using this methodology are compared to simple HS1 ratio approaches for assigning geographic origin. Contact: School of Chemistry, University of New South Wales, Sydney 2052, Australia.]
2. Daeid NN, Buchanan HAS, Savage KA, Fraser JG, Cresswell SL. **Recent advances in the application of stable isotope ratio analysis in forensic chemistry.** Australian Journal of Chemistry 2010;63(1):3-7. [Editor's Notes: This review article presents the developing use of stable isotope ratio analysis in forensic science. Recent advances in the analysis of drug samples, explosive materials, and other samples are discussed. Contact: Centre for Forensic Science, Department of Pure and Applied Chemistry, University of Strathclyde, Glasgow G1 1XW.]

\* \* \* \* \*

#### THE JOURNAL/TEXTBOOK COLLECTION EXCHANGE

The Journal/Textbook Collection Exchange is a service intended to facilitate the transfer of unwanted journals and textbooks to forensic libraries or other *Microgram* subscribers. The current donations are listed below. The offers are First Come/First Serve (except **libraries have preference**). There are no charges to the requestor. Please provide a full mailing address in the request. **Important!:** Do not provide an address that irradiates mail!

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## EMPLOYMENT OPPORTUNITIES

**Position:** Forensic Chemist

**Location:** DEA Laboratories in: Largo, MD; Chicago, IL; New York, NY; Dallas, TX; Miami, FL; Vista, CA; Sterling, VA; and San Francisco, CA.

**Announcement Number:** F-DEA-LABS-10-0367-DEU

**Salary:** \$35,675 - \$105,897 depending on experience

**Application Deadline:** April 30, 2010

**Duties:** Performs analyses on drug evidence and interprets data to detect, identify, and quantitate controlled substances. Determines the identity and/or concentration of adulterants and diluents, which meet established thresholds. Renders expert testimony on own work in Federal, State, or local courts. Assists prosecuting attorneys in the preparation of technical aspects of a case. As directed or requested provides advice and/or assistance in the performance of enforcement activities such as clandestine laboratory seizures and vacuum sweep searches for controlled substances. Operates various analytical instrumentation such as HPLC, GC/FID, GC/MS, UV/VIS. When necessary revises and develops procedures to accomplish the analyses of complex drug mixtures or trace quantities of particular substances. Writes laboratory reports which describe all tests performed, calculations, and conclusions.

**General Requirements:** A. Applicants must show successful completion of a full four-year college course of study in an accredited college or university leading to a bachelor's or higher degree in physical sciences, life sciences, or engineering that included 30 semester hours in chemistry, supplemented by course work in mathematics through differential and integral calculus, and at least 6 semester hours of physics. -OR- B. An appropriate combination of education and experience with course work equivalent to a major as shown in A above, including 30 semester hours in chemistry, supplemented by mathematics through differential and integral calculus, and at least 6 semester hours of physics, plus appropriate experience or additional education.

**How to Apply:** See Vacancy Announcement at [www.usajobs.gov](http://www.usajobs.gov)

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The FY 2010 schedule for the State and Local Forensic Chemists Seminar is as follows:

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September 13-17, 2010

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\* \* \* \* \*

### SCIENTIFIC MEETINGS

**Title:** 2010 Mid-Atlantic Association of Forensic Scientists Annual Meeting

**Sponsoring Organization:** Mid-Atlantic Association of Forensic Scientists

**Inclusive Dates:** May 17-21, 2010

**Location:** Penn State University (State College, PA)

**Contact Information:** [maafs@comcast.net](mailto:maafs@comcast.net)

**Website:** [www.maafs.org](http://www.maafs.org)

<b>DEA State and Local Forensic Chemist Seminar Application</b>			
Name: (PRINT NAME EXACTLY AS IT IS TO APPEAR ON CERTIFICATE)		Title:	
Employer:			
Your Office Mailing Address (include city, state, and zipcode):			Length of Service:
Business Telephone: (     )     -	Business Fax: (     )     -	Date of Application:	
Email Address:			
Education			
College or University	Degree	Major	
Please Check Which Techniques or Equipment Are Used in Your Laboratory			
<input type="checkbox"/>	Color Tests	<input type="checkbox"/>	UV
<input type="checkbox"/>	Column Chromatography	<input type="checkbox"/>	IR
<input type="checkbox"/>	Microcrystal Tests	<input type="checkbox"/>	CE
<input type="checkbox"/>	Thin Layer Chromatography	<input type="checkbox"/>	GC/MS
<input type="checkbox"/>	GC	<input type="checkbox"/>	IR
<input type="checkbox"/>	HPLC	<input type="checkbox"/>	Other (please specify)
Indicate Analytical Problem(s) Nominee Would Like to Have Covered:			
Choice of Seminar Dates:			
1st Choice:		Second Choice:	
Laboratory Chief/Director:			
Printed Name: _____		Signature: _____	
Title: _____		Date: _____	
Phone: _____			



# Microgram

## *Bulletin*

Published by:

The Drug Enforcement Administration  
Office of Forensic Sciences  
Washington, DC 20537

The U.S. Attorney General has determined that the publication of this periodical is necessary in the transaction of the public business required by the Department of Justice. Information, instruction, and disclaimers are published in the January issues.

- APRIL 2010 -

### SELECTED REFERENCES

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1. Galhena AS, Harris GA, Nyadong L, Murray KK, Fernandez FM. **Small molecule ambient mass spectrometry imaging by infrared laser ablation metastable-induced chemical ionization.** *Analytical Chemistry* 2010;82(6):2178-2181. [Editor's Notes: A novel ambient ion source termed IR laser ablation metastable-induced chemical ionization (IR-LAMICI) is presented. IR-LAMICI integrates IR laser ablation and direct analysis in real time (DART) type metastable-induced chemical ionization for open air mass spectrometry (MS) ionization. The analytical capabilities of IR-LAMICI are explored by imaging pharmaceutical tablets, screening counterfeit drugs, and probing algal tissue surfaces for natural products. The resolution of a chemical image is determined by the crater size produced with each laser pulse, not by the size of the metastable gas jet. The detection limits for an active pharmaceutical ingredient (acetaminophen) using the IR-LAMICI source is calculated to be in the low picograms. Contact: School of Chemistry and Biochemistry, Georgia Institute of Technology, Atlanta, GA 30332, USA.]

2. Morello DR, Cooper SD, Panicker S, Casale JF. **Signature profiling and classification of illicit heroin by GC/MS analysis of acidic and neutral manufacturing impurities.** Journal of Forensic Sciences 2010;55(1):42-49. [Editor's Notes: The illicit manufacture of heroin results in the formation of trace level acidic and neutral impurities. These impurities are detectable in illicit heroin and provide valuable information about the manufacturing process used. The isolation, derivatization, and semiquantitative analysis of neutral and acidic heroin manufacturing impurities by programmed temperature vaporizing injector-gas chromatography/mass spectrometry (PTV-GC/MS) is described. Trace acidic and neutral heroin impurities were isolated from basic fractions using liquid-liquid extraction. Extracted impurities were treated with N-methyl-N-trimethylsilyltrifluoroacetamide followed by PTV-GC/MS analyses. Semiquantitative data were obtained using full scan mass spectrometry utilizing unique ions or ion combinations for 36 trace impurities found in crude and/or highly refined heroin samples. Minimum detection limits for acidic and neutral impurities were estimated to be at the  $10^{-7}$  level relative to total morphine. Over 500 authentic heroin samples from South America, Mexico, Southwest Asia, and Southeast Asia were analyzed. Classification of illicit heroin based on the presence or absence and relative amounts of acidic and neutral impurities is presented. Contact: Special Testing and Research Laboratory, U.S. Drug Enforcement Administration, Dulles, VA 20166-9509, USA.]
3. Rohrbasser C, Rheme D, Decastel S, Roth S, Aja Montes M, Veuthey J, Rudaz S. **A new capillary electrophoresis device with deep UV detector based on LED technology.** Chimia 2009;63(12):890-891. [Editor's Notes: Presents the title study. Contact: Department of Chemistry, College of Engineering and Architecture of Fribourg, CH-1705 Fribourg, Switzerland.]
4. Staub A, Giraud S, Saugy M, Rudaz S, Veuthey J, Schappler J. **CE-ESI-TOF/MS for human growth hormone analysis.** Electrophoresis 2010;31(2):388-395. [Editor's Notes: The coupling of capillary electrophoresis (CE) with time-of-flight/mass spectrometry (TOF/MS) produces a very promising method that can be used to detect and identify proteins in different matrixes. This paper describes an efficient, rapid, and simple CE-electrospray ionization (ESI)-TOF/MS procedure for the analysis of endogenous human growth hormone and recombinant human growth hormone without sample preparation. This method successfully distinguished human growth hormone from recombinant human growth hormone in unknown samples. Contact: School of Pharmaceutical Sciences, University of Geneva, 1211 Geneva, Switzerland.]

#### **Additional References of Possible Interest:**

1. Lim Abdullah AF, Miskelly GM. **Recoveries of trace pseudoephedrine and methamphetamine residues from impermeable household surfaces: Implications for sampling methods used during remediation of clandestine methamphetamine laboratories.** Talanta 2010;81(1-2):455-461. [Editor's Notes: Presents the title study. Contact: Forensic Science Programme, Department of Chemistry, The University of Auckland, Private Bag, Auckland 92019, New Zealand.]

2. Van Eenoo P, Van Renterghem P, Dimopoulou CH, Delbeke FT, Georgakopoulos CG. **Estimating measurement uncertainty in quantitative methods not based on chromatography for doping control purposes.** Drug Testing and Analysis 2010;2(1):19-23. [Editor's Notes: The measurement of uncertainty estimate (MU) for quantitative results is a requirement of ISO/IEC17025. This concept is well established for chromatographic methods. However, very few practical methodologies have been published for non-chromatographic methods. A method for establishing MU for non-chromatographic methods is proposed based upon two case studies. Contact: DoCoLab, Ghent University (UGent), Zwijnaarde B-9052, Belgium.]

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*Journal of Forensic Sciences:*

2001: January (#1), March (#2), May (#3), September (#5), November (#6)

2002: Complete set

2003: Complete set

2005: January (#1), May (#3), November (#6)

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**Sponsoring Organization:** Mid-Atlantic Association of Forensic Scientists

**Inclusive Dates:** May 17-21, 2010

**Location:** Penn State University (State College, PA)

**Contact Information:** [maafs@comcast.net](mailto:maafs@comcast.net)

**Website:** [www.maafs.org](http://www.maafs.org)

\* \* \* \* \*

**Title:** 2010 Southwestern Association of Forensic Scientists Annual Meeting

**Sponsoring Organization:** Southwestern Association of Forensic Scientists

**Inclusive Dates:** September 20-24, 2010

**Location:** Great Wolf Lodge (Grapevine, TX)

**Contact Information:** [swafs2010@yahoo.com](mailto:swafs2010@yahoo.com)

**Website:** [www.swafs.us](http://www.swafs.us)

\* \* \* \* \*

**Title:** Southern Association of Forensic Scientists Annual Fall Meeting

**Sponsoring Organization:** Southern Association of Forensic Scientists

**Inclusive Dates:** September 19-24, 2010

**Location:** Hollywood Casino Hotel (Tunica, MS)

**Contact Information:** See Website

**Website:** [www.southernforensic.org](http://www.southernforensic.org)

\* \* \* \* \*



<b>DEA State and Local Forensic Chemist Seminar Application</b>			
Name: (PRINT NAME EXACTLY AS IT IS TO APPEAR ON CERTIFICATE)		Title:	
Employer:			
Your Office Mailing Address (include city, state, and zipcode):			Length of Service:
Business Telephone: (     )     -	Business Fax: (     )     -	Date of Application:	
Email Address:			
Education			
College or University	Degree	Major	
Please Check Which Techniques or Equipment Are Used in Your Laboratory			
<input type="checkbox"/>	Color Tests	<input type="checkbox"/>	UV
<input type="checkbox"/>	Column Chromatography	<input type="checkbox"/>	IR
<input type="checkbox"/>	Microcrystal Tests	<input type="checkbox"/>	CE
<input type="checkbox"/>	Thin Layer Chromatography	<input type="checkbox"/>	GC/MS
<input type="checkbox"/>	GC	<input type="checkbox"/>	IR
<input type="checkbox"/>	HPLC	<input type="checkbox"/>	Other (please specify)
Indicate Analytical Problem(s) Nominee Would Like to Have Covered:			
Choice of Seminar Dates:			
1st Choice:		2nd Choice:	
Laboratory Chief/Director:			
Printed Name: _____		Signature: _____	
Title: _____		Date: _____	
Phone: _____			



# Microgram

## *Bulletin*

Published by:  
The Drug Enforcement Administration  
Office of Forensic Sciences  
Washington, DC 20537

The U.S. Attorney General has determined that the publication of this periodical is necessary in the transaction of the public business required by the Department of Justice. Information, instruction, and disclaimers are published in the January issues.

- MAY 2010 -

### SELECTED REFERENCES

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1. Ferreira FJO, Crispim VR, Silva AX. **Detection of drugs and explosives using neutron computerized tomography and artificial intelligence techniques.** Radiation and Isotopes 2010;68(6):1012-1017. [Editor's Notes: The development of a nondestructive real-time neutron radiology with computerized tomography methodology to detect illicit drugs and plastic explosives is described. Tests using real samples proved that the system is capable of identifying 97% of the inspected materials. Contact: Instituto de Engenharia Nuclear, Rio de Janeiro, Cidade Universitaria, CEP 21945-970, Caixa Postal 68550, Brazil.]
2. Guerra-Diaz P, Gura S, Almirall JR. **Dynamic planar solid phase microextraction-ion mobility spectrometry for rapid field air sampling and analysis of illicit drugs and explosives.** Analytical Chemistry 2010;82(7):2826-2835. [Editor's Notes: A preconcentration device that targets the volatile chemical signatures associated with illicit drugs and explosives (high and low) has been designed to fit in the inlet of an ion mobility spectrometer (IMS). This is the first reporting of a fast and sensitive method

for dynamic sampling of large volumes of air using planar solid phase microextraction (PSPME) incorporating a high surface area for absorption of analytes onto a sol-gel polydimethylsiloxane (PDMS) coating for direct thermal desorption into an IMS. This device affords high extraction efficiencies due to strong retention properties at ambient temperature, resulting in the detection of analyte concentrations in the parts per trillion range when as low as 3.5 L of air are sampled over the course of 10 seconds (absolute mass detection of less than a nanogram). Dynamic PSPME was used to sample the headspace over the following: 3,4-methylenedioxymethamphetamine (MDMA) tablets resulting in the detection of 12-40 ng of piperonal, high explosives (Pentolite) resulting in the detection of 0.6 ng of 2,4,6-trinitrotoluene (TNT), and low explosives (several smokeless powders) resulting in the detection of 26-35 ng of 2,4-dinitrotoluene (2,4-DNT) and 11-74 ng of diphenylamine (DPA). Contact: Department of Chemistry and Biochemistry and International Forensic Research Institute, Florida International University, FL, USA.]

3. Roggo Y, Degardin K, Margot P. **Identification of pharmaceutical tablets by Raman spectroscopy and chemometrics.** *Talanta* 2010;81(3):988-995. [Editor's Notes: Raman spectroscopy has become an attractive tool for the analysis of pharmaceutical solid dosage forms. In this study, Raman spectroscopy is used to ensure the identity of tablets. Two calibrations have been developed in series: the first one identifies the product family while the second one specifies the formulation. This calibration strategy enables the identification of 25 product families in the absence of prior information about the sample. Raman spectroscopy coupled with chemometrics is therefore a fast and accurate tool for the identification of pharmaceutical tablets. Contact: F. Hoffmann -La Roche Ltd., Basel, Switzerland.]

#### **Additional References of Possible Interest:**

1. Anonymous. **Science in court.** *Nature* 2010;464(7287):325. [Editor's Notes: Academics are too often at loggerheads with forensic scientists. A new framework for certification, accreditation and research could help to heal the breach.]
2. Thomas A, Kohler M, Mester J, Geyer H, Schaenzer W, Petrou M, Thevis M. **Identification of the growth-hormone-releasing peptide-2 (GHRP-2) in a nutritional supplement.** *Drug Testing and Analysis* 2010;2(3):144-148. [Editor's Notes: Presents the title study. Contact: Center for Preventive Doping Research/ Institute of Biochemistry, German Sport University Cologne, Germany.]
3. Weston DJ. **Ambient ionization mass spectrometry: Current understanding of mechanistic theory; analytical performance and application areas.** *Analyst* 2010;135(4):661-668. [Editor's Notes: Ambient ionization mass spectrometry allows the rapid analysis of samples or objects in their native state in the open environment with no prior preparation. Over the past six years, the ability of these techniques to provide selective analyte desorption and ionization, in combination with mass spectrometry (MS), has provided a growing number of powerful analytical alternatives. With the emergence of new ambient ionization methods, and the complementary nature of existing desorption and/or ionization techniques, additional hyphenated methods have been devised, which pushes the total number of documented methods to almost 30. An overview of the field of ambient ionization MS will be given, followed by broad

classification to allow detailed discussion of theory and common mechanistic factors underpinning a number of key techniques. Consideration will be given to experimental design, ease of implementation and analytical performance, detailing subsequent impact on a number of application areas, both established and emerging. Contact: Clinical Pharmacology and DMPK, AstraZeneca R&D Charnwood, Bakewell Road, Loughborough LE11 5RH.]

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*Federal Criminal Code and Rules* –2008 Edition (12 copies)

*Journal of Forensic Sciences:*

2001: January (#1), March (#2), May (#3), September (#5), November (#6)

2002: Complete set

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2005: January (#1), May (#3), November (#6)

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## THE DEA FY 2010 STATE AND LOCAL FORENSIC CHEMISTS SEMINAR SCHEDULE

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## SCIENTIFIC MEETINGS

**Title:** 2010 Southwestern Association of Forensic Scientists Annual Meeting  
**Sponsoring Organization:** Southwestern Association of Forensic Scientists  
**Inclusive Dates:** September 20 - 24, 2010  
**Location:** Great Wolf Lodge (Grapevine, TX)  
**Contact Information:** [swafs2010@yahoo.com](mailto:swafs2010@yahoo.com)  
**Website:** [www.swafs.us](http://www.swafs.us)

\* \* \* \* \*

**Title:** Southern Association of Forensic Scientists Annual Fall Meeting  
**Sponsoring Organization:** Southern Association of Forensic Scientists  
**Inclusive Dates:** September 19 - 24, 2010  
**Location:** Hollywood Casino Hotel (Tunica, MS)  
**Contact Information:** See Website  
**Website:** [www.southernforensic.org](http://www.southernforensic.org)

\* \* \* \* \*

**Title:** 2010 Northwest Association of Forensic Scientists Meeting  
**Sponsoring Organization:** Northwest Association of Forensic Scientists  
**Inclusive Dates:** September 27 – October 1, 2010  
**Location:** Crown Plaza Portland (Portland, OR)  
**Contact Information:** See Website  
**Website:** [www.nwafs.org](http://www.nwafs.org)

\* \* \* \* \*

**Title:** 2010 Midwestern Association of Forensic Scientists 39<sup>th</sup> Annual Meeting  
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**Inclusive Dates:** October 4 - 8, 2010  
**Location:** Kansas City Marriott Downtown (Kansas City, MO)  
**Contact Information:** See Website  
**Website:** [www.mafs.net](http://www.mafs.net)

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<b>DEA State and Local Forensic Chemist Seminar Application</b>			
Name: (PRINT NAME EXACTLY AS IT IS TO APPEAR ON CERTIFICATE)		Title:	
Employer:			
Your Office Mailing Address (include city, state, and zipcode):			Length of Service:
Business Telephone: (     )     -	Business Fax: (     )     -	Date of Application:	
Email Address:			
Education			
College or University	Degree	Major	
Please Check Which Techniques or Equipment Are Used in Your Laboratory			
<input type="checkbox"/>	Color Tests	<input type="checkbox"/>	UV
<input type="checkbox"/>	Column Chromatography	<input type="checkbox"/>	IR
<input type="checkbox"/>	Microcrystal Tests	<input type="checkbox"/>	CE
<input type="checkbox"/>	Thin Layer Chromatography	<input type="checkbox"/>	GC/MS
<input type="checkbox"/>	GC	<input type="checkbox"/>	IR
<input type="checkbox"/>	HPLC	<input type="checkbox"/>	Other (please specify)
Indicate Analytical Problem(s) Nominee Would Like to Have Covered:			
Choice of Seminar Dates:			
1st Choice:		2nd Choice:	
Laboratory Chief/Director:			
Printed Name: _____		Signature: _____	
Title: _____		Date: _____	
Phone: _____			





# Microgram

## *Bulletin*

Published by:  
The Drug Enforcement Administration  
Office of Forensic Sciences  
Washington, DC 20537

The U.S. Attorney General has determined that the publication of this periodical is necessary in the transaction of the public business required by the Department of Justice. Information, instruction, and disclaimers are published in the January issues.

- JUNE 2010 -

### SELECTED REFERENCES

[The Selected References section is a compilation of recent publications of presumed interest to forensic chemists. Unless otherwise stated, all listed citations are published in English. Abbreviated mailing address information duplicates that which is provided by the abstracting service. Patents and Proceedings are reported only by their *Chemical Abstracts* citation number.]

1. Camilleri A, Johnston MR, Brennan M, Davis S, Caldicott DGE. **Chemical analysis of four capsules containing the controlled substance analogues 4-methylmethcathinone, 2-fluoromethamphetamine,  $\alpha$ -phthalimidopropiophenone and N-ethylcathinone.** Forensic Science International 2010;197(1-3):59-66. [Editor's Notes: Presents title study. Contact: Forensic Science, 21 Divett Place, Adelaide, SA, Australia.]
2. Rodriguez-Cruz SE, Carson KA. **Anion identification via complexation with meso-octamethylcalix(4)pyrrole and detection using electrospray ionization mass spectrometry.** Journal of Forensic Sciences 2010;55(2):499-507. [Editor's Notes: The routine identification of controlled substances and adulterants during forensic chemistry analysis often involves the identification of counter ions or salt forms present in an exhibit. Here, the use of the compound meso-octamethylcalix(4)pyrrole (C4P) during salt-form identification analysis is presented. C4P is a commercially-available, anion-

binding agent that can be reacted with a controlled substance or adulterant, resulting in the sequestration of anionic species, usually present as counter ions to the active ingredient. Formation of noncovalent complexes between the cyclic host C4P compound and anionic guests is investigated using electrospray ionization–mass spectrometry (ESI–MS). Complexes with chloride, bromide, iodide, nitrate, and acetate are readily observed and mass spectrometry analysis provides identification via molecular weight characterization. Chloride and bromide complexes are also characterized by the isotopic distribution of their molecular ions. Formation of host–guest complexes is not observed for sulfate and phosphate salts, presumably due to steric hindrance and energetically unfavorable conditions. Contact: U.S. Drug Enforcement Administration, Southwest Laboratory, Vista, CA 92081, USA.]

3. Uchiyama N, Kikura-Hanajiri R, Ogata J, Goda Y. **Chemical analysis of synthetic cannabinoids as designer drugs in herbal products.** Forensic Science International 2010;198(1-3):31-38. [Editor's Notes: Several synthetic cannabinoids were found in 44 of 46 different kinds of herbal products that are currently distributed on the illegal drug market in Japan. GC/MS and LC/MS analyses indicated that most of the products contained two major synthetic cannabinoids: cannabicyclohexanol and JWH-018. Oleamide, JWH-073, and CP-47,497 were also detected in some of the products. This study details the analysis and identification of these synthetic cannabinoids in herbal products. Contact: National Institute of Health Sciences, 1-18-1 Kamiyoga, Setagaya-ku, Tokyo 158-8501, Japan.]

#### Additional References of Possible Interest:

1. Green FM, Salter TL, Stokes P, Gilmore IS, O'Connor G. **Ambient mass spectrometry: Advances and applications in forensics.** Surface and Interface Analysis 2010;42(5):347-357. [Editor's Notes: Presents title study. Contact: National Physical Laboratory, Teddington, Middlesex TW11 0LW.]
2. Mario JR. **A probability-based sampling approach for the analysis of drug seizures composed of multiple containers of either cocaine, heroin, or Cannabis.** Forensic Science International 2010;197(1-3):105-113. [Editor's Notes: Presents title study. Contact: Suffolk County Crime Laboratory Drug Chemistry Section, Office of the Chief Medical Examiner, Hauppauge, NY 11788, USA.]
3. Pavlic M, Schubert B, Libiseller K, Oberacher H. **Comprehensive identification of active compounds in tablets by flow-injection data-dependent tandem mass spectrometry combined with library search.** Forensic Science International 2010;197(1-3):40-47. [Editor's Notes: Presents title study. Contact: Institute of Legal Medicine, Innsbruck Medical University, Muellerstrasse 44, Innsbruck 6020, Austria.]

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Employer:			
Your Office Mailing Address (include city, state, and zipcode):			Length of Service:
Business Telephone: (     )     -	Business Fax: (     )     -	Date of Application:	
Email Address:			
Education			
College or University	Degree	Major	
Please Check Which Techniques or Equipment Are Used in Your Laboratory			
<input type="checkbox"/>	Color Tests	<input type="checkbox"/>	UV
<input type="checkbox"/>	Column Chromatography	<input type="checkbox"/>	IR
<input type="checkbox"/>	Microcrystal Tests	<input type="checkbox"/>	CE
<input type="checkbox"/>	Thin Layer Chromatography	<input type="checkbox"/>	GC/MS
<input type="checkbox"/>	GC	<input type="checkbox"/>	IR
<input type="checkbox"/>	HPLC	<input type="checkbox"/>	Other (please specify)
Indicate Analytical Problem(s) Nominee Would Like to Have Covered:			
Choice of Seminar Dates:			
1st Choice:		2nd Choice:	
Laboratory Chief/Director:			
Printed Name: _____		Signature: _____	
Title: _____		Date: _____	
Phone: _____			



# Microgram

## *Bulletin*

Published by:  
The Drug Enforcement Administration  
Office of Forensic Sciences  
Washington, DC 20537

The U.S. Attorney General has determined that the publication of this periodical is necessary in the transaction of the public business required by the Department of Justice. Information, instruction, and disclaimers are published in the January issues.

- JULY 2010 -

### - SCHEDULING UPDATE -

[Editor's Preface: The following notice has been edited for *Microgram Bulletin*. See the Federal Register: June 29, 2010 (Volume 75, Number 124) (Rules and Regulations) (Page 37295-37299) for the complete text of the ruling.]

#### DEPARTMENT OF JUSTICE

#### Drug Enforcement Administration

#### 21 CFR Part 1308

[Docket No. DEA-305F] RIN 1117-AB16

#### Control of Immediate Precursor Used in the Illicit Manufacture of Fentanyl as a Schedule II Controlled Substance

**AGENCY:** Drug Enforcement Administration (DEA), Department of Justice.

**ACTION:** Final Rule.

**SUMMARY:** The Drug Enforcement Administration (DEA) is designating the precursor chemical, 4-anilino-N-phenethyl-4-piperidine (ANPP) as an immediate precursor for the schedule II controlled substance fentanyl under the definition set forth in 21 U.S.C. 802(23). Furthermore, DEA is finalizing the control of ANPP as a schedule II



substance under the Controlled Substances Act (CSA), pursuant to the authority in 21 U.S.C. 811(e), which states that an immediate precursor may be placed in the same schedule as the controlled substance it produces, without regard to the procedures required by 21 U.S.C. 811(a) and (b) and without regard to the findings required by 21 U.S.C. 811(a) and 812(b).

ANPP is the immediate chemical intermediary in the synthesis process currently used by clandestine laboratory operators for the illicit manufacture of the schedule II controlled substance fentanyl. In 2005 and 2006, the distribution of illicitly manufactured fentanyl caused an unprecedented outbreak of hundreds of fentanyl-related overdoses in the United States. DEA believes that the control of ANPP as a schedule II controlled substance is necessary to prevent its diversion as an immediate chemical intermediary for the illicit production of fentanyl.

**DATES:** This rulemaking becomes effective August 30, 2010.

**FOR FURTHER INFORMATION CONTACT:** Christine A. Sannerud, Ph.D., Chief, Drug and Chemical Evaluation Section, Office of Diversion Control, Drug Enforcement Administration, 8701 Morrisette Drive, Springfield, VA 22152 at (202) 307-7183.

#### **SUPPLEMENTARY INFORMATION:**

The DEA is extremely concerned with the recent increase in the illicit manufacture and distribution of fentanyl, which has resulted in hundreds of fentanyl-related overdoses and fentanyl-related deaths in several areas of the country. Therefore, on April 9, 2008, DEA published a Notice of Proposed Rulemaking (NPRM) [73 FR 19175] to designate the precursor chemical, 4-anilino-N-phenethyl-4-piperidine (ANPP) as an immediate precursor for the schedule II controlled substance fentanyl under the definition set forth in 21 U.S.C. 802(23). This rulemaking finalizes that NPRM.

Under the immediate precursor provision in 21 U.S.C. 811(e), DEA may schedule an immediate precursor "without regard to the findings required by" section 811(a) or section 812(b) and "without regard to the procedures" prescribed by section 811(a) and (b). Because of the authority in section 811(e), DEA need not address the "factors determinative of control" in section 811 or the findings required for placement in schedule II in section 812(b)(2).

This rulemaking finalizes two actions. It (1) designates the precursor chemical ANPP as an immediate precursor for the schedule II controlled substance fentanyl under the definition set forth in 21 U.S.C. 802(23); and (2) controls ANPP as a schedule II substance pursuant to the authority in 21 U.S.C. 811(e).

#### **Background**

Fentanyl is a schedule II controlled substance. Fentanyl and analogues of fentanyl are the most potent opioids available for human and veterinary use. Fentanyl produces opioid effects that are indistinguishable from morphine or heroin, but fentanyl has a greater potency and a shorter duration of action. Fentanyl is approximately 50 to 100 times more potent than morphine and 30 to 50 times more potent than heroin, depending on the physiological or behavioral measure, the route of administration, and other factors.

The legitimate medical use of fentanyl is for anesthesia and analgesia, but fentanyl's euphoric effects are highly sought after by narcotic addicts. Fentanyl can serve as a direct pharmacological substitute for heroin in opioid-dependent individuals. Fentanyl is a very dangerous substitute for heroin, however, because the amount that produces a euphoric effect also induces respiratory depression. Furthermore, due to fentanyl's greater potency, illicit drug dealers have trouble adjusting ("cutting") pure fentanyl into non-lethal dosage concentrations. Heroin users similarly have difficulty determining how much to take to get their "high" and sometimes mistakenly take a lethal quantity of the fentanyl. Unfortunately, only a slight excess of fentanyl can be, and is often, lethal because the resulting level of respiratory depression is sufficient to cause the user to stop breathing.

#### **Illicit Fentanyl-Related Deaths**

In 2005 and 2006, DEA saw a sharp increase in the seizures of illicit fentanyl. The distribution of illicit fentanyl or illicit fentanyl combined with heroin or with cocaine (i.e., a "speedball") resulted in an outbreak of hundreds of confirmed and suspected fentanyl-related overdose deaths in the United States since April 2005, according to the

Centers for Disease Control and Prevention and medical examiners representing numerous cities and counties across the United States. DEA terms fentanyl-related deaths "suspected" until confirmed through the completion of an autopsy, a positive toxicological testing result for fentanyl in the blood and the reporting of the death to the DEA.

To address this emergency health situation, DEA published an Interim Final Rule, "Control of a Chemical Precursor Used in the Illicit Manufacture of Fentanyl as a List I Chemical" (72 FR 20039, April 23, 2007), followed by a Final Rule (73 FR 43355, July 25, 2008), to control N-phenethyl-4-piperidone (NPP), the chemical precursor to ANPP, as a List I chemical. As DEA discussed extensively in that Interim Final Rule, at least 972 confirmed fentanyl-related deaths, and 162 suspected fentanyl-related deaths, mostly in Delaware, Illinois, Maryland, Michigan, Missouri, New Jersey, and Pennsylvania were initially reported to the DEA. The number of fentanyl-related deaths significantly decreased after October 2006 and continued at lower levels following control of the precursor NPP in 2007.

From the information and data collected, there is a strong indication that the fentanyl in these confirmed and suspected fentanyl-related deaths is the result of illicitly manufactured fentanyl, rather than from fentanyl diverted from legal pharmaceutical manufacturers. Forensic testing of seized fentanyl drug exhibits can identify manufacture procedure markers such as benzylfentanyl and ANPP. The forensic data suggests that most of these fentanyl-related deaths are from fentanyl illicitly manufactured by the procedure called the Siegfried method, discussed in DEA's Interim Final Rule, which uses NPP/ANPP.

### **Synthesis of Fentanyl**

DEA has determined from the forensic testing of seized illicit fentanyl that two primary synthesis routes (i.e., the Janssen synthesis route and the Siegfried method) are being used to produce fentanyl clandestinely. In 1965, Janssen Pharmaceutical patented the original synthesis procedure for fentanyl. The Janssen synthesis route is difficult to perform and is beyond the rudimentary skills of most clandestine laboratory operators. Only individuals who have acquired advanced chemistry knowledge and skills have successfully used this synthesis route. Forensic laboratories can determine whether fentanyl was manufactured illicitly by the Janssen route by detecting the impurity benzylfentanyl in the tested fentanyl drug exhibit.

In the early 1980s, an alternate route for fentanyl synthesis was published in the scientific literature; it uses N-phenethyl-4-piperidone (NPP) as the starting material. The NPP synthesis route is described on the Internet and is referred to as the Siegfried method. The chemical intermediary ANPP is produced during the synthesis and is the immediate precursor used in the illicit manufacture of fentanyl in the last stage of the Siegfried method. The Chemical Abstracts Service Registry Number (CASRN) for ANPP is 21409-26-7. The detection of the impurity 4-anilino-N-phenethyl-4-piperidine (ANPP) without the presence of benzylfentanyl in the fentanyl drug exhibit suggests that the fentanyl was manufactured by the Siegfried method (or a modified version) that produces the precursor ANPP and then converts ANPP directly to fentanyl. (A small amount of ANPP is not consumed in the last reaction in the synthesis, and thus a trace amount of ANPP remains in the fentanyl.)

[1] The Chemical Abstracts Service Registry Number (CASRN) is created by the Chemical Abstracts Service (CAS) Division of the American Chemical Society and is part of an automated information system housing data and information on specific, definable chemical substances. The CASRN provides consistent and unambiguous identification of chemicals and facilitates sharing of chemical information.]

The increase in street-level fentanyl may be the result of the relative ease with which fentanyl can be produced via the Siegfried method and the widespread distribution of the Siegfried method on the Internet. Preliminary data indicate that the majority of the deaths in the 2005-2006 fentanyl outbreak have resulted from the distribution of illicit fentanyl made by the Siegfried method and marked by traces of ANPP rather than benzylfentanyl.

### **Role of ANPP in Synthesis of Fentanyl**

Since 2000, four of the five domestic fentanyl clandestine laboratories seized by law enforcement agents have used the Siegfried method or a modified version of the Siegfried method in manufacturing fentanyl. The amount of illicit fentanyl and precursor chemicals found at these four laboratories could have generated a total of 5,800 grams of illicit fentanyl. Since fentanyl is potent in sub-milligram quantities, the subsequent "cutting" of 5,800 grams of illicit fentanyl would be sufficient to make about 46 million fentanyl doses.

The precursor chemical NPP is the starting material utilized in the Siegfried method of synthesizing fentanyl, both in industry and in illicit drug laboratories. Under a separate rulemaking first published as an interim rule on April 23, 2007 (72 FR 20039), followed by a final rule on July 25, 2008 (73 FR 43355), DEA has controlled the precursor NPP as a List I chemical under the regulatory control provisions of the CSA (21 CFR part 1300).

During the production process, the starting material, NPP, is subjected to a series of chemical reactions in order to produce the intermediary chemical ANPP. The ANPP is then subjected to a simple chemical reaction resulting in the synthesis of fentanyl. DEA has not identified any industrial uses for ANPP and believes that ANPP is only produced as a chemical intermediary in the production of fentanyl, either in the legitimate production of pharmaceutical fentanyl or the illicit production of fentanyl in clandestine laboratories. ANPP is, therefore, an immediate chemical intermediary in the synthesis of fentanyl and is produced primarily for this purpose.

DEA is controlling ANPP as a schedule II controlled substance in an effort to prevent its use in production of illicit fentanyl. DEA believes control is necessary to prevent unscrupulous chemists from synthesizing and distributing ANPP (as an unregulated material), and selling it through the Internet and other channels to individuals who may wish to acquire an unregulated precursor for fentanyl synthesis. DEA believes this action is also advisable in order to deter the theft of ANPP from legitimate pharmaceutical firms where it is generated in the course of fentanyl production. It has been determined by DEA's Office of Forensic Sciences that ANPP can also be produced through synthetic pathways that do not require NPP as the starting material. Therefore, DEA believes that controlling ANPP directly is necessary to prevent the illicit production of fentanyl.

### **Designation as an Immediate Precursor**

Under 21 U.S.C. 811(e), the Attorney General may place an immediate precursor into the same schedule as the controlled substance that the immediate precursor is used to make. The substance must meet the requirements of an immediate precursor under 21 U.S.C. 802(23). The term "immediate precursor" as defined in 21 U.S.C. 802 (23) means a substance:

- (A) Which the Attorney General has found to be and by regulation designated as being the principal compound used, or produced primarily for use, in the manufacture of a controlled substance;
- (B) which is an immediate chemical intermediary used or likely to be used in the manufacture of such controlled substance; and
- (C) the control of which is necessary to prevent, curtail, or limit the manufacture of such controlled substance.

DEA finds that ANPP meets the three criteria for the definition of an immediate precursor under 21 U.S.C 802 (23). First, DEA finds that ANPP is produced primarily for use in the manufacture of the schedule II controlled substance fentanyl. As stated in the preceding section, under the Siegfried method, ANPP is typically produced from the starting material NPP and is then subjected to a simple one-step chemical reaction to obtain the schedule II controlled substance fentanyl. DEA has not identified any industrial or other uses for ANPP and believes that it is produced primarily during the synthesis of fentanyl.

Second, DEA finds that ANPP is an immediate chemical intermediary used in the manufacture of the controlled substance fentanyl. As stated earlier, ANPP is produced as an intermediary in the fentanyl synthetic pathway. After it is synthesized, the ANPP is subjected to a simple chemical reaction that converts it directly to fentanyl.

Third, DEA finds that controlling ANPP is necessary to prevent, curtail, and limit the unlawful manufacture of the controlled substance fentanyl. As noted above, DEA believes this action is necessary to assist in preventing the possible theft of ANPP from legitimate pharmaceutical firms where it is a chemical intermediary generated for fentanyl production. As a schedule II substance, ANPP will be safeguarded to the same degree that pharmaceutical firms now safeguard the fentanyl that they produce. DEA believes this increased level of security is necessary to prevent diversion of ANPP.

As noted previously, ANPP can also be produced through synthetic pathways that do not require NPP as the precursor material. Accordingly, DEA believes control is necessary to prevent unscrupulous chemists from synthesizing ANPP and selling it (as an unregulated material) through the Internet and other channels to individuals who may wish to acquire an unregulated precursor for fentanyl synthesis, in order to circumvent the

regulation of NPP as a List I chemical.

DEA believes that the control of ANPP is necessary to prevent its production and use in the illicit production of fentanyl. Therefore, DEA is designating ANPP as an immediate precursor of fentanyl pursuant to 21 U.S.C. 802 (23) and 21 U.S.C. 811(e).

### **Placement in Schedule II--Findings Required Under CSA Immediate Precursor Provisions**

Under the authority in 21 U.S.C. 811(e), once ANPP is designated as an immediate precursor under 21 U.S.C. 802(23), it may be placed directly into schedule II (or a schedule with a higher numerical designation). The immediate precursor provision in 21 U.S.C. 811(e) permits DEA to schedule an immediate precursor "without regard to the findings required by" section 811(a) or section 812(b) and "without regard to the procedures" prescribed by section 811(a) and (b). Accordingly, DEA need not address the "factors determinative of control" in section 811(c) \2\ or the findings required for placement in schedule II in section 812(b)(2).\3\

[2\ Under administrative scheduling of a substance pursuant to 21 U.S.C. 811(c), DEA must consider the "factors determinative of control." The DEA must consider the following factors with respect to each drug or other substance proposed to be controlled in a schedule:

- (1) Its actual or relative potential for abuse;
- (2) Scientific evidence of its pharmacological effect, if known; (3) The state of current scientific knowledge regarding the drug or other substance;
- (4) Its history and current pattern of abuse;
- (5) The scope, duration, and significance of abuse;
- (6) What, if any, risk there is to the public health;
- (7) Its psychic or physiological dependence liability; and
- (8) Whether the substance is an immediate precursor of a substance already controlled.

21 U.S.C. 811(e) specifies that none of these factors must be considered, however, in the control of an "immediate precursor."]

[3\ The findings for schedule II include (A) the drug or other substance has a high potential for abuse; (B) the drug or other substance has a currently accepted medical use in treatment in the United States or a currently accepted medical use with severe restrictions; and (C) abuse of the drug or other substance may lead to severe psychological or physical dependence.]

Based on the finding that ANPP is an "immediate precursor" for fentanyl, DEA is hereby placing ANPP directly into schedule II.

### **NPRM Comments**

[Editor's Note: See the Federal Register for comments received and DEA's response to said comments.]

### **Requirements for Handling Schedule II Substances**

[Editor's Note: See the Federal Register for requirements for handling schedule II substances.]

### **Regulatory Certifications**

[Editor's Note: See the Federal Register for all regulatory certifications.]

### **List of Subjects in 21 CFR Part 1308**

Administrative practice and procedure, Drug traffic control, Reporting and recordkeeping requirements.

For the reasons set out above, 21 CFR part 1308 is amended as follows:

### **PART 1308--SCHEDULES OF CONTROLLED SUBSTANCES**

1. The authority citation for part 1308 continues to read as follows:

Authority: **21 U.S.C. 811, 812, 871(b)** unless otherwise noted.

2. Section 1308.12 is amended by adding a new paragraph (g)(3) to read as follows:

**Sec. 1308.12 Schedule II.**

\* \* \* \* \*

(g) \* \* \*

(3) Immediate precursor to fentanyl:

(i) 4-anilino-N-phenethyl-4-piperidine (ANPP)..... 8333

(ii) [Reserved]

Dated: June 19, 2010.

**Michele M. Leonhart,**  
*Deputy Administrator.*

[FR Doc. 2010-15520 Filed 6-28-10; 8:45 am]

BILLING CODE 4410-09-P

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# - SCHEDULING UPDATE -

[Editor's Preface: The following notice has been edited for *Microgram Bulletin*. See the Federal Register: June 29, 2010 (Volume 75, Number 124) (Rules and Regulations) (Page 37300-37301) for the complete text of the ruling.]

## DEPARTMENT OF JUSTICE

### Drug Enforcement Administration

#### 21 CFR Part 1308

[Docket No. DEA-313F] RIN 1117-AB26

### Correction of Code of Federal Regulations: Removal of Temporary Listing of Benzylfentanyl and Thenylfentanyl as Controlled Substances

**AGENCY:** Drug Enforcement Administration (DEA), Department of Justice.

**ACTION:** Final Rule.

**SUMMARY:** This rulemaking corrects Title 21 Code of Federal Regulations (CFR) by deleting regulations which list the substances benzylfentanyl and thenylfentanyl as being temporarily subject to schedule I controls under the emergency scheduling provisions of the Controlled Substances Act (CSA). The temporary scheduling of benzylfentanyl and thenylfentanyl expired on November 29, 1986. DEA determined that these compounds were both essentially inactive, with no evidence of abuse potential. As such, these compounds are no longer schedule I controlled substances and all references to these compounds are being deleted from DEA regulations.

**DATES:** This rulemaking becomes effective June 29, 2010.

**FOR FURTHER INFORMATION CONTACT:** Christine A. Sannerud, PhD, Chief, Drug and Chemical Evaluation Section, Office of Diversion Control, Drug Enforcement Administration, 8701 Morrisette Drive, Springfield, VA 22152 at (202) 307-7183.

**SUPPLEMENTARY INFORMATION:** The CSA was amended by the Comprehensive Crime Control Act of 1984 (Pub. L.98-473) which became effective on October 12, 1984. This Act included a provision (21 U.S.C. 811(h)) which allows the DEA Administrator to place a substance, on a temporary basis, into schedule I when necessary to avoid an imminent hazard to the public safety. This emergency scheduling authority permits scheduling a substance that is not currently controlled, is being abused, and is a risk to the public health while the formal rulemaking procedures (21 U.S.C. 811) described in the CSA are being conducted. A temporary scheduling order may be issued for one year with a possible extension of up to six months if formal scheduling procedures have been initiated. The proposal and order are published in the Federal Register as are the proposals and orders for formal scheduling. The emergency scheduling authority was given to DEA in an effort to streamline the scheduling process in response to the growing problem of controlled substance analogues ("designer drugs").

On October 29, 1985, DEA published a Final Rule (50 FR 43698) which temporarily placed Acetyl-alpha-methylfentanyl, Alpha-methylthiofentanyl, Beta-hydroxyfentanyl, Beta-hydroxy-3-methylfentanyl, 3-Methylthiofentanyl, Thiofentanyl, Benzylfentanyl and Thenylfentanyl into schedule I of the CSA. This control action became effective on November 29, 1985.

These substances were emergency scheduled based on their appearance in the illicit market, their similarity in chemical structure to that of controlled substances, and the likelihood that they would produce pharmacological effects similar to those of prototypic schedule I or II substances. Often there is no biological data available prior to the emergency control of illicitly produced and abused substances. Therefore, information derived from structure-activity relationship considerations plays an important role in emergency scheduling. To keep an emergency scheduled substance in schedule I, DEA must initiate traditional scheduling procedures (21 U.S.C. 811) for that substance during the one year period in which it is emergency controlled and complete the action before the expiration of 18 months. The time limitations of emergency scheduling underscore the need for timely abuse liability data and the need to determine the most efficient tests to provide the data necessary to make permanent scheduling decisions. During the one-year temporary scheduling period, DEA must acquire sufficient data to make a determination as to whether the emergency scheduled substance should remain under the CSA. Often the substances have never been studied nor are they available for study. DEA, as soon as possible after identifying a newly abused substance, provides for the synthesis of this substance for analytical reference standards and biological testing. Only then can the appropriate pharmacological and abuse liability tests be conducted.

In an effort to assess the addiction liability of these compounds, DEA contracted studies of each of the temporarily scheduled fentanyl compounds at the University of Michigan Medical School in Ann Arbor and at the Medical College of Virginia in Richmond. The studies indicated that while most of the fentanyl compounds had abuse liability profiles that warranted control, two of these temporarily scheduled compounds (benzylfentanyl and thenylfentanyl) did not have an addiction-forming or addiction-sustaining liability similar to morphine.

Based on the results of these studies, on November 28, 1986, the DEA extended the temporary scheduling of six of these substances in schedule I. However, benzylfentanyl and thenylfentanyl were specifically omitted from this extension (and any future permanent control) because the pharmacological and biological testing of the substances, which included assessment of morphine-like activity, addiction liability, and analgesic effect, indicated that the compounds were both essentially inactive, with no evidence of abuse potential.

Both of these substances were temporarily controlled because they were initially found in street samples with other fentanyl analogues and were most likely unreacted intermediates in the synthesis of the target fentanyl analogues. The DEA, having concluded that these two drugs lacked morphine-like addictive properties, allowed the temporary regulation of benzylfentanyl and thenylfentanyl to expire on November 29, 1986. Therefore, these two substances were no longer regulated as controlled substances upon that date. In contrast, however, DEA chose to extend temporary control of the other four fentanyl compounds in a Final Rule published November 26, 1986 (51 FR 42834) and permanently controlled them in a Final Rule published May 29, 1987 (52 FR 20070).

#### **Action of This Rulemaking**

After the temporary listing of benzylfentanyl and thenylfentanyl expired in November of 1986, these compounds were no longer controlled under the CSA. However, DEA never deleted 21 CFR 1308.11(g)(1) and (g)(2) that reference the listing of these compounds temporarily in schedule I. This rulemaking hereby corrects the CFR to



delete 21 CFR 1308.11(g)(1) and (g)(2) which previously stated:

(1) N-[1-benzyl-4-piperidyl]-N-phenylpropanamide 9818 (benzylfentanyl), its optical isomers, salts and salts of isomers.

(2) N-[1-(2-thienyl)methyl-4-piperidyl]-N-phenylpropanamide 9834 (thenylfentanyl), its optical isomers, salts and salts of isomers.

This action therefore corrects part 1308 to remove any reference to control of benzylfentanyl and thenylfentanyl in schedule I.

### **Regulatory Certifications**

[Editor's Note: See the Federal Register for all regulatory certifications.]

### **List of Subjects in 21 CFR Part 1308**

Administrative practice and procedure, Drug traffic control, Reporting and recordkeeping requirements.

For the reasons set out above, 21 CFR part 1308 is amended as follows:

### **PART 1308--SCHEDULES OF CONTROLLED SUBSTANCES**

1. The authority citation for part 1308 continues to read as follows:

Authority: 21 U.S.C. 811, 812, 871(b) unless otherwise noted.

2. Section 1308.11 is amended by revising paragraph (g) to read as follows:

Sec. 1308.11 Schedule I.

\* \* \* \* \*

(g) Temporary listing of substances subject to emergency scheduling. Any material, compound, mixture or preparation which contains any quantity of the following substances:

(1) [Reserved.]

(2) [Reserved.]

Dated: June 19, 2010.

**Michele M. Leonhart,**  
*Deputy Administrator.*

[FR Doc. 2010-15529 Filed 6-28-10; 8:45 am]

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**- SCHEDULING UPDATE -**

[Editor's Preface: The following notice has been edited for *Microgram Bulletin*. See the Federal Register: June 29, 2010 (Volume 75, Number 124) (Rules and Regulations) (Page 37301-37307) for the complete text of the ruling.]

**DEPARTMENT OF JUSTICE**

**Drug Enforcement Administration**

**21 CFR Part 1310**

**[Docket No. DEA-222F] RIN 1117-AA64**

**Exempt Chemical Mixtures Containing Gamma-Butyrolactone**

**AGENCY:** Drug Enforcement Administration (DEA), Department of Justice.

**ACTION:** Final Rule.

**SUMMARY:** This rulemaking finalizes a November 12, 2008, Notice of Proposed Rulemaking in which DEA proposed that chemical mixtures that are 70 percent or less gamma-butyrolactone (GBL), by weight or volume, be automatically exempt from regulatory controls under the Controlled Substances Act (CSA). DEA is seeking through this rulemaking to exempt only those chemical mixtures that do not represent a significant risk of diversion. This regulation makes GBL chemical mixtures, in concentrations greater than 70 percent, subject to List I chemical regulatory requirements of the CSA, except if exempted through an existing categorical exemption. DEA is taking this action because there is a serious threat to the public safety associated with the ease by which GBL is chemically converted to the schedule I controlled substance gamma-hydroxybutyric acid (GHB).

DEA recognizes that concentration criteria alone cannot identify all mixtures that warrant exemption. As a result, DEA regulations provide for an application process by which manufacturers may obtain exemptions from CSA regulatory controls for those GBL chemical mixtures that are not automatically exempt under the concentration criteria.

**DATES:** This rulemaking becomes effective July 29, 2010. Persons seeking registration must apply on or before July 29, 2010 to continue their business pending final action by DEA on their application.

**FOR FURTHER INFORMATION CONTACT:** Christine A. Sannerud, PhD, Chief, Drug and Chemical Evaluation Section, Office of Diversion Control, Drug Enforcement Administration, 8701 Morrisette Drive, Springfield, VA 22152; Telephone: (202) 307-7183.

**SUPPLEMENTARY INFORMATION:**

**DEA's Legal Authority**

DEA implements the Comprehensive Drug Abuse Prevention and Control Act of 1970, often referred to as the Controlled Substances Act (CSA) and Controlled Substances Import and Export Act (21 U.S.C. 801 et seq.), as amended. DEA publishes the implementing regulations for these statutes in Title 21 of the Code of Federal Regulations (CFR), parts 1300 to end. These regulations are designed to ensure that there is a sufficient supply of controlled substances for legitimate medical purposes and to deter the diversion of controlled substances to illegal purposes. The CSA mandates that DEA establish a closed system of control for manufacturing, distributing, and dispensing controlled substances. Any person who manufactures, distributes, dispenses, imports, exports, or conducts research or chemical analysis with controlled substances must register with DEA (unless exempt) and comply with the applicable requirements for the activity. The CSA as amended also requires DEA to regulate the

manufacture and distribution of chemicals that may be used to manufacture controlled substances. Listed chemicals that are classified as List I chemicals are important to the manufacture of controlled substances. Those classified as List II chemicals may be used to manufacture controlled substances.

### **Illicit Uses of Gamma-Butyrolactone**

Gamma-Butyrolactone, or GBL, is a chemical that is used as a precursor in the illicit manufacture of the schedule I controlled substance gamma-hydroxybutyric acid, or GHB. GBL is a necessary and important chemical precursor in the clandestine synthesis of GHB because, to date, no other chemical has been identified as a substitute for GBL in the clandestine process. Congress recognized this and regulated GBL as a List I chemical upon enactment of Pub. L. 106-172, the Hillory J. Farias and Samantha Reid Date-Rape Drug Prohibition Act of 2000, on February 18, 2000.

GBL and GHB induce a sense of euphoria and intoxication and are abused for their central nervous system (CNS) depressant effect. An overdose from GBL or GHB may result in respiratory depression, coma, and even death. Both substances have been associated with drug-facilitated sexual assaults. The Drug Abuse Warning Network (DAWN) is a national surveillance system operated by the Substance Abuse and Mental Health Services Administration (SAMHSA) to monitor trends in drug emergency department visits. SAMHSA collects information on GHB and GBL separately but reports GHB and GBL together in its publications. This reflects the similar threat to public safety and abuse liability of GBL to GHB.

The conversion of GBL to GHB in a clandestine laboratory is a simple one-step process. Availability of GBL is the determining factor in producing GHB, not the execution of complicated chemical procedures or having sophisticated scientific equipment. GBL is a unique chemical precursor. It can be either converted into GHB by a simple chemical reaction or efficiently converted into GHB by the body upon ingestion, thus producing the same pharmacological effects as ingesting GHB. For this reason, abusers or predators seeking to use GBL on their victims routinely substitute GBL for GHB to obtain the same type of intoxication.

### **Other Laws That Apply to GBL: Controlled Substance Analogue Provisions**

Section 802(32)(B) of Title 21 provides that the designation of GBL, or any other chemical, as a listed chemical does not preclude a finding that the chemical is a controlled substance analogue under subparagraph (A) of the definition 21 U.S.C. 802(32)(A).<sup>11</sup> A controlled substance analogue is treated, for purposes of Federal law, as a schedule I controlled substance to the extent intended for human consumption (21 U.S.C. 813). The analogue provision of the CSA has been applied to prosecute individuals who have diverted GBL for human consumption. Although a chemical commodity when used by legitimate industry, diversion of GBL is tantamount to diversion of a schedule I controlled substance if intended for human consumption.

[<sup>11</sup> 21 U.S.C. 802(32)(A) Except as provided in subparagraph (C), the term "controlled substance analogue" means a substance -- (i) The chemical structure of which is substantially similar to the chemical structure of a controlled substance in schedule I or II; (ii) Which has a stimulant, depressant, or hallucinogenic effect on the central nervous system that is substantially similar to or greater than the stimulant, depressant, or hallucinogenic effect on the central nervous system of a controlled substance in schedule I or II; or (iii) With respect to a particular person, which such person represents or intends to have a stimulant, depressant, or hallucinogenic effect on the central nervous system that is substantially similar to or greater than the stimulant, depressant, or hallucinogenic effect on the central nervous system of a controlled substance in schedule I or II. (B) The designation of gamma butyrolactone or any other chemical as a Listed chemical pursuant to paragraph (34) or (35) does not preclude a finding pursuant to paragraph (A) of this paragraph that the chemical is a controlled substance analogue.]

### **Concern Over GBL-Containing Chemical Mixtures**

Prior to control as a List I chemical, GBL had been sold under false pretenses to disguise its intended use. Suppliers pretended that GBL was being sold for use as ink jet printer cleaners, room deodorizers, and as educational kits (which purport to demonstrate the scientific principle of an exothermic chemical reaction).

Since the designation of GBL as a List I chemical in 2000, persons who manufacture, distribute, import, or export GBL must be registered with DEA and maintain records of transactions in GBL. These regulatory requirements prevent unscrupulous persons from freely distributing GBL. Persons without a legitimate business need to manufacture or distribute GBL do not receive the required registration from DEA. DEA believes that those wishing to traffic GBL are less willing to purchase GBL from DEA-approved registrants who are required to maintain records that are accessible to DEA.

DEA has observed the retail marketing and promotion of chemical mixtures containing GBL. Exempt chemical mixtures containing GBL were sold as cosmetic products and contained greater than 99 percent GBL (along with dye(s), fragrance(s), skin conditioners, and other ingredients). DEA became aware that persons were purchasing such products for conversion to GHB or directly ingesting these products for their GBL content. Retailers reported that they quickly sold out of these products. DEA notified retailers of the potential for abuse, which resulted in the voluntary withdrawal of these products from store shelves. Manufacturers of said products stated their intent to reformulate these products.

DEA is concerned that legitimate businesses may be unintentionally contributing to the diversion of GBL. Without regulatory controls, DEA is unable to monitor distributions of such chemical mixtures containing GBL, since registration and recordkeeping requirements do not apply. Regulation of GBL chemical mixtures pursuant to 21 U.S.C. 802(39)(A)(vi) is necessary to reduce the threat to the public health and safety.

### **Defining a Chemical Mixture**

Title 21 U.S.C. 802(40) defines the term "chemical mixture" as "a combination of two or more chemical substances, at least one of which is not a List I chemical or a List II chemical, except that such term does not include any combination of a List I chemical or a List II chemical with another chemical that is present solely as an impurity." Therefore, a chemical mixture contains any number of listed chemicals in combination with any number of non-listed chemicals.

DEA does not consider a chemical mixture to mean the combination of a listed chemical and an inert carrier. An inert carrier is any chemical that does not modify the function of the listed chemical but is present to aid in the delivery of the listed chemical. Examples include, but are not limited to, dilutions in water and the presence of a carrier gas. For purposes of control under the CSA, these examples would be controlled as List I or List II chemicals, not as a chemical mixture containing a List I or List II chemical.

### **Past Regulations Regarding Chemical Mixtures**

The Chemical Diversion and Trafficking Act of 1988 (Pub. L. 100- 690) (CDTA) created the legal definition of a "chemical mixture" (21 U.S.C. 802(40)), and exempted chemical mixtures from regulatory coverage. The CDTA established 21 U.S.C. 802(39)(A)(v) to exclude "any transaction in a chemical mixture" from the definition of a "regulated transaction." The result of such exemption was that it provided traffickers with an unregulated source for obtaining listed chemicals for use in the illicit manufacture of controlled substances.

The Domestic Chemical Diversion Control Act of 1993 (Pub. L. 103- 200) (DCDCA), enacted in April 1994, subjected all chemical mixtures containing List I and List II chemicals to CSA regulatory requirements, unless such chemical mixtures were specifically exempted by regulation. The regulatory requirements include recordkeeping, reporting, and security for all regulated chemical mixtures with the additional requirement of registration for handlers of List I chemical mixtures. The DCDCA also provided the Attorney General with the authority to establish regulations exempting chemical mixtures from the definition of a "regulated transaction," "based on a finding that the mixture is formulated in such a way that it cannot be easily used in the illicit production of a controlled substance and that the listed chemical or chemicals contained in the mixture cannot be readily recovered" (21 U.S.C. 802(39)(A)(vi)).

DEA treats all chemical mixtures containing List I and List II chemicals as non-regulated (upon the withdrawal of its proposed rule "Implementation of the Domestic Chemical Diversion Control Act of 1993 (DCDCA)" (59 FR 51887, October 13, 1994; withdrawn at 59 FR 63738, December 9, 1994)) until it promulgates a final rule that identifies chemical mixtures that are exempt for each List I and List II chemical. The withdrawal sought to prevent the immediate regulation of qualified chemical mixtures, which was not necessary and would impose an undue burden on industry. It also provided DEA the opportunity to gather information to implement regulations pursuant to 21 U.S.C. 802(39)(A)(vi).

In 2003, DEA published a Final Rule (68 FR 23195, May 1, 2003) that identified exempt mixtures containing the chemicals ephedrine, N- methylephedrine, N-methylpseudoephedrine, norpseudoephedrine, phenylpropanolamine, and pseudoephedrine, with an effective date of June 2, 2003. In a second Final Rule (69 FR 74957, December 15, 2004; corrected at 70 FR 294, January 4, 2005,) DEA promulgated regulations that

defined exempt chemical mixtures for 27 of the remaining 38 listed chemicals. The effective date was January 14, 2005. As gamma-butyrolactone (GBL) was not a listed chemical when DEA initiated this regulatory action in 1998, regulation of chemical mixtures containing gamma-butyrolactone was not addressed but was the subject of a separate regulatory action.

### **Regulations Regarding Chemical Mixtures Containing GBL**

On July 19, 2002, DEA published in the Federal Register an Advance Notice of Proposed Rulemaking (ANPRM) (67 FR 47403; corrected at 67 FR 53842, August 19, 2002; corrected at 67 FR 56776, September 5, 2002) in anticipation of identifying GBL-containing chemical mixtures to exempt by regulation. The ANPRM invited interested persons to submit information related to legitimate formulations containing GBL, including the concentration of GBL in their mixtures. Comments received to that ANPRM provided information DEA used in its Notice of Proposed Rulemaking.

On November 12, 2008, DEA published a Notice of Proposed Rulemaking (73 FR 66815) which proposed the control of certain GBL chemical mixtures.

### **Defining Exempt Chemical Mixtures Containing GBL**

In defining exempt chemical mixtures containing GBL for purposes of the proposed rule, the clandestine use of GBL and the requirements of 21 U.S.C. 802(39)(A)(vi) were heavily considered. The requirements described by statute do not allow for exemptions based on such factors as: (1) Manufacturers selling only to known customers, (2) the cost of the mixture, (3) the customer's knowledge of the product's chemical content, packaging, and/or such related topics. 21 U.S.C. 802(39)(A)(vi) requires DEA to establish an exemption based on the finding (1) that the mixture is formulated in such a way that it cannot be easily used in the illicit production of a controlled substance and (2) that the listed chemical or chemicals contained in the mixture cannot be readily recovered.

After examination of the comments on the ANPRM and after weighing the risk of diversion, on November 12, 2008 (73 FR 66815), DEA proposed a 70 percent concentration limit (by weight or volume) to identify GBL chemical mixtures that do not pose a significant risk of diversion. In that NPRM, DEA stated that it anticipated that chemical mixtures over 70 percent, as identified for use as protective coatings and films, will be automatically exempt pursuant to 21 CFR 1310.12(d)(2) ("Completely formulated paints and coatings"), which is being revised to clarify that film-forming agents are exempted. Additionally, the NPRM clarified that other chemical mixtures having concentrations of GBL over 70 percent may qualify for exemption via the application process (21 CFR 1310.13). DEA proposed a 70 percent concentration limit in an effort to prevent the automatic exemption of chemical mixtures with higher concentration limits such as solvent-based mixtures (e.g., cleaners or thinners) which DEA had concluded could be useful to traffickers.

### **Comments**

[Editor's Note: See the Federal Register for comments received and DEA's response to said comments.]

### **Thresholds and Excluded Transactions for Regulated GBL Chemical Mixtures**

The List I chemical GBL, as described in 21 CFR 1310.04(g)(1), does not have a threshold. Therefore, all transactions in regulated GBL chemical mixtures are regulated transactions. Certain transactions described in 21 CFR 1310.08 are excluded from the definition of a regulated transaction. These excluded transactions, as specified in 21 CFR 1310.08(d), are domestic, import, and export distributions of GBL weighing 4,000 kilograms (net weight) or more in a single container. This exclusion also applies to chemical mixtures.

### **Requirements That Apply to Regulated List I Chemical Mixtures**

[Editor's Note: See the Federal Register for requirements that apply to regulated List I chemical mixtures.]

### **Regulatory Certifications**

[Editor's Note: See the Federal Register for all regulatory certifications.]

## List of Subjects in 21 CFR Part 1310

Drug traffic control, List I and List II chemicals, Reporting requirements.

For the reasons set out above, 21 CFR part 1310 is amended as follows:

### PART 1310--RECORDS AND REPORTS OF LISTED CHEMICALS AND CERTAIN MACHINES

1. The authority citation for part 1310 continues to read as follows:

Authority: 21 U.S.C. 802, 827(h), 830, 871(b), 890.

2. Section 1310.09 is amended by adding new paragraph (k) to read as follows:

Sec. 1310.09 Temporary exemption from registration.

\* \* \* \* \*

(k)(1) Each person required by sections 302 or 1007 of the Act (21 U.S.C. 822, 957) to obtain a registration to manufacture, distribute, import, or export regulated GBL-containing chemical mixtures, pursuant to sections 1310.12 and 1310.13, is temporarily exempted from the registration requirement, provided that DEA receives a properly completed application for registration or application for exemption on or before July 29, 2010. The exemption will remain in effect for each person who has made such application until the Administration has approved or denied that application. This exemption applies only to registration; all other chemical control requirements set forth in parts 1309, 1310, and 1313 of this chapter remain in full force and effect.

(2) Any person who manufactures, distributes, imports or exports a GBL-containing chemical mixture whose application for exemption is subsequently denied by DEA must obtain a registration with DEA. A temporary exemption from the registration requirement will also be provided for those persons whose applications for exemption are denied, provided that DEA receives a properly completed application for registration on or before 30 days following the date of official DEA notification that the application for exemption has been denied. The temporary exemption for such persons will remain in effect until DEA takes final action on their registration application.

3. Section 1310.12 is amended in the Table of Concentration Limits in paragraph (c) by adding gamma-butyrolactone in alphabetical order between "Ethylamine and its salts" and "Hydriodic acid" under List I chemicals and by revising paragraph (d)(2) to read as follows:

Sec. 1310.12 Exempt chemical mixtures.

(c) \* \* \*

Table of Concentration Limits

	DEA chemical Code Number	Concentration	Special Conditions
List I Chemicals			
Gamma-Butyrolactone	2011	70% by weight or volume	

(d) \* \* \*

(2) Completely formulated paints and coatings: Completely formulated paints and coatings are only those formulations that contain all of the components of the paint or coating for use in the final application without the



need to add any additional substances except a thinner if needed in certain cases. A completely formulated paint or coating is defined as any clear or pigmented liquid, liquefiable or mastic composition designed for application to a substrate in a thin layer that is converted to a clear or opaque solid protective, decorative, or functional adherent film after application. Included in this category are clear coats, top-coats, primers, varnishes, sealers, adhesives, lacquers, stains, shellacs, inks, temporary protective coatings and film-forming agents.

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Dated: June 18, 2010.

**Michele M. Leonhart,**  
*Deputy Administrator.*

[FR Doc. 2010-15518 Filed 6-28-10; 8:45 am]

BILLING CODE 4410-09-P

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## SELECTED REFERENCES

[The Selected References section is a compilation of recent publications of presumed interest to forensic chemists. Unless otherwise stated, all listed citations are published in English. Abbreviated mailing address information duplicates that which is provided by the abstracting service. Patents and Proceedings are reported only by their *Chemical Abstracts* citation number.]

1. Aturki Z, D'Orazio G, Rocco A, Bortolotti F, Gottardo R, Tagliaro F, Fanali S. **CEC-ESI ion trap MS of multiple drugs of abuse.** Electrophoresis 2010;31(7):1256-1263. [Editor's Notes: A method for the separation and determination of nine drugs of abuse, including amphetamines, cocaine, codeine, heroin, and morphine is presented. The CEC experiments were performed in fused silica capillaries (100  $\mu$ m x 30 cm) packed with a 3  $\mu$ m cyano derivatized silica stationary phase. Contact: Istituto di Metodologie Chimiche, Monterotondo Scalo, Consiglio Nazionale delle Ricerche, Rome, Italy.]
2. Maietti S, Castagna F, Molin L, Ferrara SD, Traldi P. **Cocaine adulterants used as marker compounds.** Journal of Mass Spectrometry 2009;44(7):1124-1126. [Editor's Notes: Cocaine samples have been analyzed in order to identify, on the basis of the adulterants contained therein, their possible production area and the mechanism by which they have been placed on the market. Contact: Forensic Toxicology and Antidoping Unit, University Hospital of Padova, 135121 Padua, Italy.]
3. Martino R, Malet-Martino M, Gilard V, Balayssac S. **Counterfeit drugs: Analytical techniques for their identification.** Analytical and Bioanalytical Chemistry 2010; No pp. yet given. [Editor's Notes: Presents title study. Contact: Universite de Toulouse, Toulouse Cedex 9 31062, France.]

### Additional References of Possible Interest:

1. Collins M, Salouros H, Cawley AT, Robertson J, Heagney AC, Arenas-Queralt A.  **$\delta^{13}\text{C}$  and  $\delta^2\text{H}$  isotope ratios in amphetamine synthesized from benzaldehyde and nitroethane.** Rapid Communications in Mass Spectrometry 2010;24(11):1653-1658. [Editor's Notes: Presents title study. Contact: National Measurement Institute, Australian Forensic Drug Laboratory, Sydney, Australia.]
2. Green G, Thevis M, Trevorrow P. **Growth hormone: Barriers to the implementation of human growth hormone testing in sport.** Drug Testing and Analysis 2009;1(9-10):455-456. [Editor's Notes: Presents title study. Contact: Pacific Palisades Medical Group, USA.]

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- 1991: March (#2)
- 1992: January (#1), March (#2), July (#4), September (#5), November (#6)
- 1993: January (#1), March (#2), May (#3), July (#4), September (#5)
- 1998: September (#5)
- 2000: January (#1), March (#2), May (#3), July (#4), September (#5)
- 2001: Complete set
- 2002: Complete set
- 2003: Complete set
- 2004: Complete set
- 2005: Complete set
- 2006: Complete set
- 2007: January (#1), March (#2), November (#6)
- 2008: Complete set
- 2009: Complete set

*Forensic Science Review:*

- 1999: December (#2)
- 2000: January (#1-2)
- 2006: January (#1), July (#2)

*Forensic Science International:*

- 2004: July (#2-3), August (#1), October (#2-3), November (#1), December (#2-3), December (Supplemental)
- 2005: January (#1), January (#2-3), March (#2-3)

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## THE DEA FY 2010 STATE AND LOCAL FORENSIC CHEMISTS SEMINAR SCHEDULE

The FY 2010 schedule for the State and Local Forensic Chemists Seminar is as follows:

September 13-17, 2010

The school is open only to forensic chemists working for law enforcement agencies. It is intended for chemists who have completed their agency's internal training program and have also been working on the bench for at least one year. There is no tuition charge. The course is held at the Hyatt Place Dulles North Hotel in Sterling, Virginia (near the Washington/Dulles International Airport). A copy of the application form is reproduced on the last page of this issue of *Microgram Bulletin*. Completed applications should be mailed to the Special Testing and Research Laboratory (Attention: J. Head) at 22624 Dulles Summit Court, Dulles, VA 20166. For additional information, call (703) 668-3349.

\* \* \* \* \*

## SCIENTIFIC MEETINGS

**Title:** 2010 Southwestern Association of Forensic Scientists Annual Meeting  
**Sponsoring Organization:** Southwestern Association of Forensic Scientists  
**Inclusive Dates:** September 20 - 24, 2010  
**Location:** Great Wolf Lodge (Grapevine, TX)  
**Contact Information:** [swafs2010@yahoo.com](mailto:swafs2010@yahoo.com)  
**Website:** [www.swafs.us](http://www.swafs.us)

\* \* \* \* \*

**Title:** Southern Association of Forensic Scientists Annual Fall Meeting  
**Sponsoring Organization:** Southern Association of Forensic Scientists  
**Inclusive Dates:** September 19 - 24, 2010  
**Location:** Hollywood Casino Hotel (Tunica, MS)  
**Contact Information:** See Website  
**Website:** [www.southernforensic.org](http://www.southernforensic.org)

\* \* \* \* \*

**Title:** 2010 Northwest Association of Forensic Scientists Meeting  
**Sponsoring Organization:** Northwest Association of Forensic Scientists  
**Inclusive Dates:** September 27 - October 1, 2010  
**Location:** Crown Plaza Portland (Portland, OR)  
**Contact Information:** See Website  
**Website:** [www.nwafs.org](http://www.nwafs.org)

\* \* \* \* \*

**Title:** 2010 Midwestern Association of Forensic Scientists 39<sup>th</sup> Annual Meeting  
**Sponsoring Organization:** Midwestern Association of Forensic Scientists  
**Inclusive Dates:** October 4 - 8, 2010  
**Location:** Kansas City Marriott Downtown (Kansas City, MO)  
**Contact Information:** See Website  
**Website:** [www.mafs.net](http://www.mafs.net)

\* \* \* \* \*

**Title:** The 2010 NEAFS & NEDIAI Joint Meeting  
**Sponsoring Organization:** North Eastern Association of Forensic Scientist and the New England Division IAI Program  
**Inclusive Dates:** November 8 - 12, 2010  
**Location:** Equinox Golf Resort and Spa (Manchester, VT)  
**Contact Information:** [NEAFS2010@gmail.com](mailto:NEAFS2010@gmail.com)  
**Website:** [www.neafs.org](http://www.neafs.org)

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<b>DEA State and Local Forensic Chemist Seminar Application</b>			
Name: (PRINT NAME EXACTLY AS IT IS TO APPEAR ON CERTIFICATE)		Title:	
Employer:			
Your Office Mailing Address (include city, state, and zipcode):			Length of Service:
Business Telephone: (     )     -	Business Fax: (     )     -	Date of Application:	
Email Address:			
Education			
College or University	Degree	Major	
Please Check Which Techniques or Equipment Are Used in Your Laboratory			
<input type="checkbox"/>	Color Tests	<input type="checkbox"/>	UV
<input type="checkbox"/>	Column Chromatography	<input type="checkbox"/>	IR
<input type="checkbox"/>	Microcrystal Tests	<input type="checkbox"/>	CE
<input type="checkbox"/>	Thin Layer Chromatography	<input type="checkbox"/>	GC/MS
<input type="checkbox"/>	GC	<input type="checkbox"/>	IR
<input type="checkbox"/>	HPLC	<input type="checkbox"/>	Other (please specify)
Indicate Analytical Problem(s) Nominee Would Like to Have Covered:			
Choice of Seminar Dates:			
1st Choice:		2nd Choice:	
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Printed Name: _____		Signature: _____	
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Phone: _____			



# Microgram

## *Bulletin*

Published by:

The Drug Enforcement Administration  
Office of Forensic Sciences  
Washington, DC 20537

The U.S. Attorney General has determined that the publication of this periodical is necessary in the transaction of the public business required by the Department of Justice. Information, instruction, and disclaimers are published in the January issues.

- AUGUST 2010 -

### SELECTED REFERENCES

[The Selected References section is a compilation of recent publications of presumed interest to forensic chemists. Unless otherwise stated, all listed citations are published in English. Abbreviated mailing address information duplicates that which is provided by the abstracting service. Patents and Proceedings are reported only by their *Chemical Abstracts* citation number.]

1. Buchanan HAS, Daeid NN, Kerr WJ, Carter JF, Hill JC. **Role of Five Synthetic Reaction Conditions on the Stable Isotopic Composition of 3,4-Methylenedioxymethamphetamine.** *Analytical Chemistry* 2010;82(13):5484-5489. [Editor's Notes: The identification of links between seizures of illicit 3,4-methylenedioxymethamphetamine (MDMA or "ecstasy") has been a global target of law enforcement agencies in recent years. Previous work has shown that, when the reaction conditions are carefully repeated from batch to batch, stable isotope ratios allow the discrimination of MDMA-hydrochloride batches according to synthetic route used for manufacture. In this study, the effects of altering five reaction conditions relating to the Pt/H<sub>2</sub> reductive amination synthesis were, for the first time, systematically investigated using a two level, five factor factorial design. Results indicate that the  $\delta^2\text{H}$  values of MDMA hydrochloride are affected by the length of imine stir time, and the  $\delta^{15}\text{N}$  values are affected by the degree of excess methylamine employed. Furthermore, the  $\delta^{13}\text{C}$  and  $\delta^{18}\text{O}$  values have been shown to be affected by the efficiency of the



reaction, despite the similarity in carbon and oxygen composition of the starting material and product molecules. In addition to being of theoretical importance in this field of analytical science overall, this work is essential in order to more fully contextualize the interpretation of IRMS data which may be used as potential forensic evidence. Contact: Centre for Forensic Science, Department of Pure & Applied Chemistry, University of Strathclyde, Glasgow G1 1WX, UK.]

2. Maher HM, Awad T, DeRuiter J, Clark CR. **GC- IRD methods for the identification of some tertiary amines related to MDMA.** Forensic Science International 2010;199 (1-3):18-28. [Editor's Notes: Presents title study. Contact: Department of Pharmaceutical Analytical Chemistry, Faculty of Pharmacy, Alexandria University, Alexandria 21521, Egypt.]

#### Additional References of Possible Interest:

1. Anderson M, Wilcox K, Guericke M, Chu H, Wilson MV, Wilson E, Lucas K, Holmes AE. **Enantiodiscrimination of methamphetamine by circular dichroism using a porphyrin tweezer.** Chirality 2010;22(4):398-402. [Editor's Notes: Exciton-coupled circular dichroism (ECCD) spectroscopy was able to differentiate between the two enantiomers of methamphetamine using a commercially available porphyrin tweezer as an achiral host. The host-guest complex formed with (+)-(S)-methamphetamine produced a negative bisignate-shaped ECCD spectrum, whereas the complex formed with (-)-(R)-methamphetamine produced a positive one. This sensitive technique could serve as an alternative method for the enantiodiscrimination of chiral methamphetamine. Contact: Department of Chemistry, Doane College, Crete, NE 68333, USA.]
2. Rodomonte AL, Gaudiano MC, Antoniella E, Lucente D, Crusco V, Bartolomei M, Bertocchi P, Manna L, Valvo L, Alhaique F, Muleri N. **Counterfeit drugs detection by measurement of tablets and secondary packaging colour.** Journal of Pharmaceutical and Biomedical Analysis 2010, 53(2), 215-220. [Editor's Notes: Presents title study. Contact: Istituto Superiore di Sanita, Dipartimento del Farmaco, Viale Regina Elena 299, Rome 00161, Italy.]

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#### THE JOURNAL/TEXTBOOK COLLECTION EXCHANGE

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*CRC Handbook of Chemistry and Physics, 49<sup>th</sup> Edition (1968-1969)*

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1992: January (#1), March (#2), July (#4), September (#5), November (#6)

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**Website:** [www.neafs.org](http://www.neafs.org)

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Email Address:			
Education			
College or University	Degree	Major	
Please Check Which Techniques or Equipment Are Used in Your Laboratory			
<input type="checkbox"/>	Color Tests	<input type="checkbox"/>	UV
<input type="checkbox"/>	Column Chromatography	<input type="checkbox"/>	IR
<input type="checkbox"/>	Microcrystal Tests	<input type="checkbox"/>	CE
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<input type="checkbox"/>	HPLC	<input type="checkbox"/>	Other (please specify)
Indicate Analytical Problem(s) Nominee Would Like to Have Covered:			
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1st Choice:		2nd Choice:	
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**Published by:**

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The U.S. Attorney General has determined that the publication of this periodical is necessary in the transaction of the public business required by the Department of Justice. Information, instruction, and disclaimers are published in the January issues.

- SEPTEMBER 2010 -

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1. Al-Hossaini, AM, Awad T, De Ruiter J, Clark, CR. **GC-MS and GC-IRD analysis of ring and side chain regioisomers of ethoxyphenethylamines related to the controlled substances MDEA, MDMMA, and MBDB.** Forensic Science International 2010;200(1-3):73-86. [Editor's Notes: Presents title study. Contact: Department of Pharmacal Sciences, Harrison School of Pharmacy, Auburn University, Auburn, AL 36849, USA.]
2. Broseus J, Anglada F, Esseiva P. **The differentiation of fibre- and drug type Cannabis seedlings by gas chromatography/mass spectrometry and chemometric tools.** Forensic Science International 2010;200(1-3):87-92. [Editor's Notes: Cannabis cultivation in order to produce drugs is forbidden in Switzerland. Thus, law enforcement authorities regularly ask forensic laboratories to determinate cannabis plant's chemotype from seized material in order to ascertain that the plantation is legal or not. Because the EU official analytical protocol requires the measurement of the

amount of THC from the flowers at maturity, laboratories have to allow the plant to grow to maturity. This study investigated the discrimination of fiber type from drug type Cannabis seedlings by analyzing the compounds found in their leaves and using chemometrics tools. This model allows then discrimination between fiber and drug type Cannabis at an early stage of growth. 11 legal varieties allowed by the Swiss Federal Office for Agriculture and 13 illegal ones were greenhouse grown and analyzed using GC/MS. Compounds that show high discrimination capabilities in the seedlings have been identified and a support vector machines (SVMs) analysis was used to classify the cannabis samples. The overall set of samples shows a classification rate above 99% with false positive rates less than 2%. This model allows for the discrimination between fiber and drug type Cannabis at an early stage of growth. Contact: Institut de Police Scientifique, School of Criminal Sciences, Batochime, University of Lausanne, Lausanne-Dorigny 1015, Switz.]

3. David GE, Coxon A, Frew RD, Hayman AR. **Isotope fractionation during precipitation of methamphetamine HCl and discrimination of seized forensic samples.** Forensic Science International 2010;200(1-3):123-129. [Editor's Notes: Studies have focused on stable isotope analysis by isotope ratio mass spectrometry (IRMS) to link samples of methamphetamine synthesized together or from the same source of precursor. For this reason, it is important to understand potential sources of isotope fractionation that could cause variability in forensic data sets. In this study, methamphetamine free base samples were synthesized from (-)-ephedrine HCl using the HI/red phosphorus synthetic route and then precipitated as HCl salts by bubbling with HCl gas. The entire sample did not precipitate when first bubbled with gas, and multiple precipitation steps were required. Fractions of precipitate were individually analyzed for  $\delta^{13}\text{C}$ ,  $\delta^{15}\text{N}$ , and  $\delta^2\text{H}$  by IRMS. Both  $\delta^{15}\text{N}$  and  $\delta^2\text{H}$  were found to become more negative, with the heavy isotopes depleted, in successive fractions of precipitate. Homogenizing the precipitate fractions together could eliminate this fractionation. However, in a clandestine situation this fractionation could lead to greater than expected  $\delta^{15}\text{N}$  and  $\delta^2\text{H}$  variability between illicit samples of methamphetamine HCl that have been synthesized from the same sample of ephedrine. This needs to be taken into account when interpreting forensic IRMS data. We also present an analysis of four separate seized case lots of methamphetamine HCl, taking into account the possible sources of fractionation and available intelligence information. Contact: Department of Chemistry, University of Otago, PO Box 56, Dunedin, Otago 9054, N. Z.]

#### **Additional References of Possible Interest:**

1. Bugay DE, Brush RC. **Chemical identity testing by remote-based dispersive Raman spectroscopy.** Applied Spectroscopy 2010;64(5):467-475. [Editor's Notes: Presents title study. Contact: PharmAnalysis, Inc., West Lafayette, IN 47906, USA.]
2. Dumarey M, Vander Heyden Y, Rutan SC. **Evaluation of the identification power of RPLC analyses in the screening for drug compounds.** Analytical Chemistry 2010;82(14):6056-6065. [Editor's Notes: Presents title study. Contact: Department of Chemistry, Virginia Commonwealth University, Richmond, VA 23284-2006, USA.]



3. Tyrkkoe E, Pelander A, Ojanperae I. **Differentiation of structural isomers in a target drug database by LC/Q-TOFMS using fragmentation prediction.** Drug Testing and Analysis 2010;2(6):259-270. [Editor's Notes: Presents title study. Contact: Department of Forensic Medicine, University of Helsinki, Helsinki FI-00014, Finland.]

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**Title:** American Academy of Forensic Sciences 2011 Annual Meeting  
**Sponsoring Organization:** American Academy of Forensic Sciences  
**Inclusive Dates:** February 21 – 26, 2011  
**Location:** Hyatt Regency (Chicago, IL)  
**Contact Information:** [See website](#)  
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Business Telephone: (     )     -	Business Fax: (     )     -	Date of Application:	
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Education			
College or University	Degree	Major	
Please Check Which Techniques or Equipment Are Used in Your Laboratory			
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1. Epplé R, Blanes L, Beavis A, Roux C, Doble P. **Analysis of amphetamine-type substances by capillary zone electrophoresis using capacitively coupled contactless conductivity detection.** *Electrophoresis* 2010;31(15):2608-2613. [Editor's Notes: CE with capacitively coupled contactless conductivity detection (C<sup>4</sup>D) was employed for the separation and detection of seven amphetamine analogs as well as amphetamine, dextroamphetamine, methamphetamine, and MDMA. The separation electrolyte was 30 mM hydroxypropyl- $\beta$ -cyclodextrin (HP $\beta$ CD) in a 75 mM acetic acid+25 mM sodium acetate buffer adjusted to pH 4.55. Conductivity detection was compared with UV detection using this electrolyte. Average detection limits for C<sup>4</sup>D and UV were 1.3 and 1.0 ppm, respectively. The effects of HP $\beta$ CD concentration and BGE composition on the selectivity of the separation were also investigated. An illicit sample of MDMA (ecstasy) and a prescription dextroamphetamine tablet were also analyzed. Contact: Centre for Forensic Science, Department of Chemistry and Forensic Science, University of Technology Sydney (UTS), Sydney, Australia.]

2. Weston RG. **Quick screening of crystal methamphetamine/methyl sulfone exhibits by Raman spectroscopy.** Journal of Forensic Sciences 2010;55(4):1068-1075. [Editor's Notes: The analysis of mixtures of "crystal meth" (usually comprised of methylsulfone [MS] and methamphetamine [MA]) by gas chromatography/mass spectrometry (GC/MS) is routine in many forensic drug labs. The utilization of Raman spectroscopy for the identification of such mixtures quickly and without the need for a separation technique is discussed. Samples were dissolved in water and Raman spectra of the resulting aqueous solutions were collected. By comparing these spectra to spectra of MS and MA mixtures of known composition, an indication of the composition of the sample can be obtained in only a few minutes. This spectral comparison also can be used as a semi-quantitative analysis of MA concentrations in such exhibits. Contact: Oklahoma State Bureau of Investigation, Edmond, OK 73034, USA.)

#### Additional References of Possible Interest:

1. Fegas R, Bensalem A, Bettache Z, Righezza M. **Simultaneous separation of quinine and its diastereoisomer quinidine by RP-HPLC.** Asian Journal of Chemistry 2010;22(2):1587-1590. [Editor's Notes: Presents Title Study. Contact: Laboratoire de la police scientifique Alger, Algeria.]
2. Sacre P, Deconinck E, De Beer T, Courselle P, Vancauwenberghe R, Chiap P, Crommen J, De Beer JO. **Comparison and combination of spectroscopic techniques for the detection of counterfeit medicines.** Journal of Pharmaceutical and Biomedical Analysis 2010;53(3):445-453. [Editor's Notes: Presents Title Study. Contact: Laboratory of Drug Analysis, Scientific Institute of Public Health, Rue Juliette Wytsmanstraat 14, Brussels 1050, Belgium.]
3. Vardakou I, Pistos C, Spiliopoulou Ch. **Spice drugs as a new trend: Mode of action, identification and legislation.** Toxicology Letters 2010;197(3):157-162. [Editor's Notes: Presents Title Study. Contact: Department of Forensic Medicine and Toxicology, School of Medicine, National and Kapodistrian University of Athens, Athens 115 27, Greece.]

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Email Address:			
Education			
College or University	Degree	Major	
Please Check Which Techniques or Equipment Are Used in Your Laboratory			
<input type="checkbox"/>	Color Tests	<input type="checkbox"/>	UV
<input type="checkbox"/>	Column Chromatography	<input type="checkbox"/>	IR
<input type="checkbox"/>	Microcrystal Tests	<input type="checkbox"/>	CE
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1st Choice:		2nd Choice:	
Laboratory Chief/Director:			
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Phone: _____			



# Microgram

## *Bulletin*

**Published by:**

The Drug Enforcement Administration  
Office of Forensic Sciences  
Washington, DC 20537

The U.S. Attorney General has determined that the publication of this periodical is necessary in the transaction of the public business required by the Department of Justice. Information, instruction, and disclaimers are published in the January issues.

- NOVEMBER 2010 -

### SELECTED REFERENCES

[The Selected References section is a compilation of recent publications of presumed interest to forensic chemists. Unless otherwise stated, all listed citations are published in English. Abbreviated mailing address information duplicates that which is provided by the abstracting service. Patents and Proceedings are reported only by their *Chemical Abstracts* citation number.]

1. Booth AL, Wooller MJ, Howe T, Haubenstock N. **Tracing geographic and temporal trafficking patterns for marijuana in Alaska using stable isotopes (C, N, O and H).** Forensic Science International 2010;202(1-3):45-53. [Editor's Notes: Presents title study. Contact: Alaska Stable Isotope Facility, Water and Environmental Research Center, University of Alaska Fairbanks, Fairbanks, AK 99775, USA.]
2. Brandt SD, Martins CPB. **Analytical methods for psychoactive N,N-dialkylated tryptamines.** Trends in Analytical Chemistry 2010;29(8):858-869. [Editor's Notes: This review provides an overview of analytical methodologies published in recent years on detection and characterization of 40 N,N-dialkylated derivatives. The majority of literature available utilized reversed-phase high-performance liquid chromatography, gas chromatography, and/or capillary electrophoresis. Derivatization was not normally required for sufficient separation and detection. Bioanalytical applications and characterization of natural products have not been included due to space limitations.]

Contact: School of Pharmacy and Biomolecular Sciences, Liverpool John Moores University, Liverpool L3 3AF, UK.]

#### **Additional References of Possible Interest:**

1. Fakhari AR, Nojavan S, Ebrahimi SN, Evenhuis CJ. **Optimized ultrasound-assisted extraction procedure for the analysis of opium alkaloids in papaver plants by cyclodextrin-modified capillary electrophoresis.** *Journal of Separation Science* 2010;33(14):2153-2159. [Editor's Notes: Presents title study. Contact: Department of Chemistry, Faculty of Sciences, Shahid Beheshti University, Evin, Tehran, Iran.]
2. Garry M. **Infrared analysis for the busy crime laboratory - getting the most out of illicit drug analysis using FT-IR and GC-MS.** *Spectroscopy* 2010;(Suppl.):20-21. [Editor's Notes: Presents title study. Contact: Thermo Fisher Scientific, Madison, WI, USA.]
3. Knight G, Hansen S, Connor M, Poulsen H, McGovern C, Stacey J. **The results of an experimental indoor hydroponic Cannabis growing study, using the Screen of Green' (ScrOG) method-yield, tetrahydrocannabinol (THC) and DNA analysis.** *Forensic Science International* 2010;202(1-3):36-44. [Editor's Notes: Presents title study. Contact: Institute of Environmental Science and Research Limited (ESR Ltd), Kenepuru Science Centre, 34 Kenepuru Drive, Porirua, N. Z.]

\* \* \* \* \*

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1991: March (#2)  
1992: January (#1), March (#2), July (#4), September (#5), November (#6)  
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2001: Complete set  
2002: Complete set

#### *Journal of Forensic Sciences:*

2003: Complete set  
2004: Complete set  
2005: Complete set  
2006: Complete set  
2007: January (#1), March (#2), November (#6)

*Forensic Science Review:*

1999: December (#2)

2000: January (#1-2)

2006: January (#1), July (#2)

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## THE DEA FY 2011 STATE AND LOCAL FORENSIC CHEMISTS SEMINAR SCHEDULE

The FY 2011 schedule for the State and Local Forensic Chemists Seminar is as follows:

March 7-11, 2011

June 6-10, 2011

September 12-16, 2011

The school is open only to forensic chemists working for law enforcement agencies. It is intended for chemists who have completed their agency's internal training program and have also been working on the bench for at least one year. There is no tuition charge. The course is held at the Hyatt Place Dulles North Hotel in Sterling, Virginia (near the Washington/Dulles International Airport). A copy of the application form is reproduced on the last page of this issue of *Microgram Bulletin*. Completed applications should be mailed to the Special Testing and Research Laboratory (Attention: J. Head) at 22624 Dulles Summit Court, Dulles, VA 20166. For additional information, call (703) 668-3349.

\* \* \* \* \*

## SCIENTIFIC MEETINGS

**Title:** American Academy of Forensic Sciences 2011 Annual Meeting

**Sponsoring Organization:** American Academy of Forensic Sciences

**Inclusive Dates:** February 21-26, 2011

**Location:** Hyatt Regency (Chicago, IL)

**Contact Information:** See website

**Website:** [www.aafs.org](http://www.aafs.org)

\* \* \* \* \*

<b>DEA State and Local Forensic Chemist Seminar Application</b>			
Name: (PRINT NAME EXACTLY AS IT IS TO APPEAR ON CERTIFICATE)		Title:	
Employer:			
Your Office Mailing Address (include city, state, and zipcode):			Length of Service:
Business Telephone: (     )     -	Business Fax: (     )     -	Date of Application:	
Email Address:			
Education			
College or University	Degree	Major	
Please Check Which Techniques or Equipment Are Used in Your Laboratory			
<input type="checkbox"/>	Color Tests	<input type="checkbox"/>	UV
<input type="checkbox"/>	Column Chromatography	<input type="checkbox"/>	IR
<input type="checkbox"/>	Microcrystal Tests	<input type="checkbox"/>	CE
<input type="checkbox"/>	Thin Layer Chromatography	<input type="checkbox"/>	GC/MS
<input type="checkbox"/>	GC	<input type="checkbox"/>	IR
<input type="checkbox"/>	HPLC	<input type="checkbox"/>	Other (please specify)
Indicate Analytical Problem(s) Nominee Would Like to Have Covered:			
Choice of Seminar Dates:			
1st Choice:		2nd Choice:	
Laboratory Chief/Director:			
Printed Name: _____		Signature: _____	
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- DECEMBER 2010 -

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- PROPOSED RULE -

[Editor's Preface: The following notice has been edited for *Microgram Bulletin*. See the Federal Register: October 27, 2011, (Volume 75, Number 207) (Rules and Regulations) (Pages 66195-66199) for the complete text of the proposed rule.]

### DEPARTMENT OF JUSTICE

### Drug Enforcement Administration

### 21 CFR Part 1308

[Docket No. DEA-338]

### Schedules of Controlled Substances: Placement of Propofol Into Schedule IV; Proposed Rule

**AGENCY:** Drug Enforcement Administration, Department of Justice.

**ACTION:** Notice of proposed rulemaking.

**SUMMARY:** This proposed rule is issued by the Deputy Administrator of the Drug Enforcement Administration (DEA) to place the substance propofol, including its salts, isomers, and salts of isomers whenever the existence of such salts, isomers, and salts of isomers is possible, into schedule IV of the Controlled Substances Act (CSA). This proposed action is based on a recommendation from the Assistant Secretary for Health of the Department of Health and Human Services (DHHS) and on an evaluation of the relevant data by DEA. If finalized, this action would impose the regulatory controls and criminal sanctions of schedule IV on those who handle propofol and products containing propofol.

**DATES:** Written comments must be postmarked on or before December 27, 2010, and electronic comments must be sent on or before midnight Eastern Time December 27, 2010.

**ADDRESSES:** To ensure proper handling of comments, please reference "Docket No. DEA-327" on all written and electronic correspondence. Written comments sent via regular or express mail should be sent to the Drug Enforcement Administration, Attention: DEA Federal Register Representative/ODL, 8701 Morrisette Drive, Springfield, Virginia 22152. Comments may be sent to DEA by sending an electronic message to [dea.diversion.policy@usdoj.gov](mailto:dea.diversion.policy@usdoj.gov). Comments may also be sent electronically through <http://www.regulations.gov> using the electronic comment form provided on that site. An electronic copy of this document is also available at the <http://www.regulations.gov> Web site. DEA will accept electronic comments containing Microsoft Word, WordPerfect, Adobe PDF, or Excel file formats only. DEA will not accept any file format other than those specifically listed here. Please note that DEA is requesting that electronic comments be submitted before midnight Eastern Time on the day the comment period closes because <http://www.regulations.gov> terminates the public's ability to submit comments at midnight Eastern Time on the day the comment period closes. Commenters in time zones other than Eastern Time may want to consider this so that their electronic comments are received. All comments sent via regular or express mail will be considered timely if postmarked on the day the comment period closes.

**FOR FURTHER INFORMATION CONTACT:** Christine A. Sannerud, PhD, Chief, Drug and Chemical Evaluation Section, Office of Diversion Control, Drug Enforcement Administration, 8701 Morrisette Drive, Springfield, Virginia 22152, Telephone: (202) 307-7183.

**SUPPLEMENTARY INFORMATION:** Posting of Public Comments: Please note that all comments received are considered part of the public record and made available for public inspection online at <http://www.regulations.gov> and in the Drug Enforcement Administration's public docket. Such information includes personal identifying information (such as your name, address, etc.) voluntarily submitted by the commenter.

[Editor's Note: See the Federal Register for further information on the posting comments and requests not to post personal identifying information.]

### **Background**

On March 18, 2008, the Drug Enforcement Administration (DEA) received a petition requesting that **21 CFR 1308.13** be amended so that propofol be controlled as a schedule III substance under the CSA. The basis of the petition was the reports of increased incidences of propofol abuse during the past decade. The petitioner stated as the main argument in support of the request that:

*"Propofol is the most common intravenous anesthetic in the United States today but over the course of the decade, documented cases of abuse have been steadily increasing over the past 10 years \* \* \* Unfortunately, there is also a very high mortality rate (greater than 33%) associated with this abuse."*

The petitioner stated that controlling propofol as a scheduled drug would require all practitioners to strictly monitor the access and use of propofol and possibly save lives.

Propofol was approved in 1989 and is an ultra-short acting intravenous (i.v.) anesthetic under the commercial name, Diprivan[supreg]. Propofol is also marketed as a generic drug under three trade names. Two veterinary versions, Rapinovet and PropoFlo/ PropoVet were approved for marketing in 1999 and 2000, respectively. Propofol is indicated in adults for the initiation and maintenance of Monitored Anesthesia Care (MAC) sedation, combined sedation, and regional anesthesia. It is also indicated for Intensive Care Unit (ICU) sedation of intubated and mechanically ventilated patients. For children, propofol is indicated for induction and maintenance of general anesthesia. Diprivan[supreg] is an injectable emulsion (10 mg/ mL).

Propofol, or 2,6-diisopropylphenol, is slightly soluble in water and is formulated in an oil-in-water emulsion that is milky-white in appearance. Fospropofol, the water-soluble O-methyl-phosphate disodium salt prodrug of propofol, has been recently controlled as a schedule IV substance under the CSA.

Propofol binds to the gamma-aminobutyric acid (GABAA) receptors and acts as a modulator by potentiating the activity of GABA at these receptors. Other psychoactive drugs that are controlled under the CSA, e.g., barbiturates (schedule II and III) and benzodiazepines (schedule IV), potentiate the activity of GABA at the GABAA receptors.

[Editor's Note: See the Federal Register for information on Animal self-administration studies.]

The motivation for abuse of propofol is generally for its sedative and relaxing properties and induction of euphoric effects. There have also been reports that propofol's ability to induce sexual illusions and disinhibition contributes to its appeal as a drug of abuse. Anecdotal reports of propofol abusers described their experiences as "pleasant," "euphoric," and "relaxing."

The current abuse profiles of propofol indicate that it is abused by medical professionals since they have access to the drug in medical facilities which perform anesthesia (Adverse Event Reporting System (AERS) DataMart database). In the AERS database, there are reports of propofol diversion and abuse, some of which resulted in death. In 96 percent of these cases, the abusers were health care providers or were in training programs to become health care professionals. Propofol is not currently controlled by either the Federal Government or State governments, and may not be a target or priority of law enforcement; therefore, information on reported seizures and cases from Federal, State and local law enforcement agencies is very limited.

Schedule IV sedative-hypnotics, such as methohexital and midazolam, are known to produce euphoric moods and have histories of abuse in the United States and other countries. There have been published case reports of individuals who became dependent on propofol. These reports indicated that the individuals expressed a "craving" for propofol, causing them to compulsively self-inject daily. They were abusing propofol for its relaxing and euphoric effects. In a survey of academic anesthesiology programs, 18 percent reported diversion or abuse of propofol. Twenty-eight percent of the reported abusers of propofol had died due to propofol overdose. The individuals who died were affiliated with health care facilities in which there were no pharmacy or security mechanisms to control access to propofol. In a published survey of certified registered nurse anesthetists, propofol was reported to be the fourth most preferred drug to misuse among this population. Propofol abuse is associated with significant adverse health effects, including death. The known major side effects include pancreatitis, pulmonary edema, cardiovascular depression, and respiratory depression. The cause of death with propofol toxicity is due to severe respiratory depression.

Withdrawal symptoms observed upon ceasing long-term administration of a substance are indicative of a substance's ability to produce physical dependence. There have been published reports of withdrawal symptoms upon an abrupt cessation of administration of propofol after a prolonged treatment. The symptoms include agitation, tremors, tachycardia, tachypnea, hyperpyrexia, confusion, and hallucinations. These symptoms are similar to the symptoms observed upon withdrawal from benzodiazepines. Withdrawal symptoms improve once administration of propofol is reinitiated. A delusional state lasting up to seven days may occur before full mental functioning returns. It should be noted that after a prolonged administration of propofol, the cessation of administration should be done cautiously and the patient should be monitored for any signs of a withdrawal syndrome.

Propofol has been on the market since 1989, but, due to propofol being unavailable to the general public, the seizures of propofol on the Federal, State and local levels are very low. Medical professionals are the predominant population who are abusers of propofol. Subsequent to DEA gathering and evaluating the available data on propofol, on July 2, 2009, DEA requested that DHHS provide a scientific and medical evaluation of the available information and a scheduling recommendation for propofol, in accordance with **21 U.S.C. 811(b)**. On May 14, 2010, the Assistant Secretary for Health, DHHS, sent the Deputy Administrator of DEA a scientific and medical evaluation and a letter recommending that propofol be placed into schedule IV of the CSA. Enclosed with the April 30, 2010, letter was a document prepared by the Food and Drug Administration (FDA) entitled, "Basis for the Recommendation for Control of Propofol and Its Salts in Schedule IV of the Controlled Substances Act (CSA)." The document contained a review of the factors which the CSA requires the Secretary to consider (21 U.S.C. 811(b)).

The references to the studies used in the evaluations for DHHS' scheduling recommendation and DEA's independent analysis can be found in both documents. These documents are available on the electronic docket associated with this rule making.

The factors considered by the Assistant Secretary of Health and DEA with respect to propofol were:

- (1) Its actual or relative potential for abuse;
- (2) Scientific evidence of its pharmacological effects;
- (3) The state of current scientific knowledge regarding the drug;
- (4) Its history and current pattern of abuse;

- (5) The scope, duration, and significance of abuse;
- (6) What, if any, risk there is to the public health;
- (7) Its psychic or physiological dependence liability; and
- (8) Whether the substance is an immediate precursor of a substance already controlled under this subchapter. (21 U.S.C. 811(c))

Based on the recommendation of the Assistant Secretary for Health, received in accordance with section 201(b) of the Act (21 U.S.C. 811(b)), and the independent review of the available data by DEA, the Deputy Administrator of DEA, pursuant to sections 201(a) and 201(b) of the Act (21 U.S.C. 811(a) and 811(b)), finds that:

- (1) Propofol has a low potential for abuse relative to the drugs or substances in schedule III. The abuse potential of propofol is comparable to the schedule IV substances, methohexital and midazolam;
- (2) Propofol has a currently accepted medical use in treatment in the United States; propofol under the trade name Diprivan<sup>supreg</sup> was approved for marketing as a product indicated for monitored anesthesia care by FDA in 1989; and
- (3) Abuse of propofol may lead to limited psychological dependence or physical dependence relative to the drugs or other substances in schedule III.

Based on these findings, the Deputy Administrator of DEA concludes that propofol, including its salts, isomers, and salts of isomers, whenever the existence of such salts, isomers, and salts of isomers is possible, warrants control in schedule IV of the CSA (**21 U.S.C. 812(b)(4)**).

#### **Comments and Requests for Hearing**

[Editor's Note: See the Federal Register for information on comments and requests for hearings.]

#### **Requirements for Handling Propofol**

[Editor's Note: See the Federal Register for all requirements for handling propofol.]

#### **Regulatory Certifications**

[Editor's Note: See the Federal Register for all regulatory certifications.]

### **PART 1308--SCHEDULES OF CONTROLLED SUBSTANCES**

The authority citation for 21 CFR part 1308 continues to read as follows:

Authority: 21 U.S.C. 811, **812, 871(b)** unless otherwise noted.

**Section 1308.14** is amended by redesignating paragraphs (c)(46) through (c)(52) as paragraphs (c)(47) through (c)(53) and adding a new paragraph (c)(46) as follows:

#### **Sec. 1308.14 Schedule IV.**

\* \* \* \* \* (c) \* \* \* \*

(46) Propofol..... 2139

\* \* \* \* \*

Dated: October 19, 2010.

**Michele M. Leonhart,**  
*Deputy Administrator.*

[FR Doc. 2010-27193 Filed 10-26-10; 8:45 am]  
BILLING CODE 4410-09-P

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## SELECTED REFERENCES

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1. Zhang X, Jia B, Huang K, Hu B, Chen R, Chen H. **Tracing origins of complex pharmaceutical preparations using surface desorption atmospheric pressure chemical ionization mass spectrometry.** *Analytical Chemistry* 2010;82(19):8060-8070. [Editor's Notes: A novel strategy to trace the origins of commercial pharmaceutical products has been developed based on the direct chemical profiling of the pharmaceutical products by surface desorption atmospheric pressure chemical ionization mass spectrometry (DAPCI-MS). Besides the unambiguous identification of active drug components, various compounds present in the matrixes are simultaneously detected without sample pretreatment, providing valuable information for drug quality control and origin differentiation. Four sources of commercial amoxicillin products made by different manufacturers have been successfully differentiated. This strategy has been extended to screening six sources of Liuwei Dihuang Teapills, which are herbal medicine preparations with extremely complex matrixes. The photolysis status of chemical drug products and the inferior natural herd medicine products prepared with different processes (e.g., extra heating) were also screened using the method reported here. The limit of detection achieved in the MS/MS experiments was estimated to be 1 ng/g for amoxicillin inside the capsule product. The experimental data demonstrate that DAPCI-MS is a useful tool for rapid pharmaceutical analysis, showing promising perspectives for tracking the entire pharmaceutical supply chain to prevent counterfeit intrusions. Contact: Department of Applied Chemistry, East China Institute of Technology, Fuzhou, Jiangxi 344000, Peoples Republic of China.]

### Additional References of Possible Interest:

1. Marini RD, Rozet E, Montes MLA, Rohrbasser C, Roht S, Rheme D, Bonnabry P, Schappler J, Veuthey JL, Hubert Ph, Rudaz S. **Reliable low-cost capillary electrophoresis device for drug quality control and counterfeit medicines.** *Journal of Pharmaceutical and Biomedical Analysis* 2010;53(5):1278-1287. [Editor's Notes: Presents title study. Contact: Laboratory of Analytical Chemistry, Centre Interfacultaire de Recherche du Medicament, Institute of Pharmacy, CHU, University of Liege, B36, Liege B-4000, Belgium.]
2. Rodionova OYe, Pomerantsev AL. **NIR-based approach to counterfeit-drug detection.** *Trends in Analytical Chemistry* 2010;29(8):795-803. [Editor's Notes: Presents title study. Contacts: Semenov Institute of Chemical Physics RAS, Moscow 119991, Russia.]

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## SCIENTIFIC MEETINGS

**Title:** American Academy of Forensic Sciences 2011 Annual Meeting

**Sponsoring Organization:** American Academy of Forensic Sciences

**Inclusive Dates:** February 21-26, 2011

**Location:** Hyatt Regency (Chicago, IL)

**Contact Information:** [See website](#)

**Website:** [www.aafs.org](http://www.aafs.org)

\* \* \* \* \*

## MICROGRAM EMAIL ADDRESS CHANGE

Effective January 1, 2011, the email address for the *Microgram* Editor will be:

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The current email address ([dea-microgram-2010 -at- mailsnare.net](mailto:dea-microgram-2010-mailsnare.net)) will be monitored until January 31, 2011. An automated response will direct senders to the new address until April 1, 2011, at which point the account will lapse.

Important Notes to All Subscribers: All subscribers with filters on their accounts should immediately “whitelist” the [DEA-Microgram -at- usdoj.gov](mailto:DEA-Microgram-usdoj.gov) email address. In addition, it is recommended that the current and previous email addresses used for *Microgram* ([dea-microgram-2010 -at- mailsnare.net](mailto:dea-microgram-2010-mailsnare.net)) be automatically filtered (blocked) after January 1, 2011. This address will no longer be used by *Microgram* after this date; therefore, any subsequent emails from any previous *Microgram* email address will be spam.

All subscribers should notify their IT security personnel of all the above changes.

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Name: (PRINT NAME EXACTLY AS IT IS TO APPEAR ON CERTIFICATE)		Title:	
Employer:			
Your Office Mailing Address (include city, state, and zipcode):			Length of Service:
Business Telephone: (     )     -	Business Fax: (     )     -	Date of Application:	
Email Address:			
Education			
College or University	Degree	Major	
Please Check Which Techniques or Equipment Are Used in Your Laboratory			
<input type="checkbox"/>	Color Tests	<input type="checkbox"/>	UV
<input type="checkbox"/>	Column Chromatography	<input type="checkbox"/>	IR
<input type="checkbox"/>	Microcrystal Tests	<input type="checkbox"/>	CE
<input type="checkbox"/>	Thin Layer Chromatography	<input type="checkbox"/>	GC/MS
<input type="checkbox"/>	GC	<input type="checkbox"/>	Other (please specify)
<input type="checkbox"/>	HPLC	<input type="checkbox"/>	Other (please specify)
Indicate Analytical Problem(s) Nominee Would Like to Have Covered:			
Choice of Seminar Dates:			
1st Choice:		2nd Choice:	
Laboratory Chief/Director:			
Printed Name: _____		Signature: _____	
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- JANUARY 2011 -

- SCHEDULING UPDATE -

[Editor's Preface: The following notice has been edited for Microgram Bulletin. See the Federal Register: November 24, 2010 (Volume 75, Number 226) (Proposed Rules) (Pages 71635-71638) for the complete text.]

**DEPARTMENT OF JUSTICE**

**Drug Enforcement Administration**

**21 CFR Part 1308**

[Docket No. DEA-345N]

**Schedules of Controlled Substances: Temporary Placement of Five Synthetic Cannabinoids Into Schedule I**

**AGENCY:** Drug Enforcement Administration (DEA), U.S. Department of Justice.

**ACTION:** Notice of Intent.

**SUMMARY:** The Deputy Administrator of the Drug Enforcement Administration (DEA) is issuing this notice of intent to temporarily place five synthetic cannabinoids into the Controlled Substances Act (CSA) pursuant to the temporary scheduling provisions under **21 U.S.C. 811(h)** of the CSA. The substances are 1-pentyl-3-(1-naphthoyl)indole (JWH-018), 1-butyl-3-(1-naphthoyl)indole (JWH-073), 1-[2-(4-morpholinyl)ethyl]-3-(1-naphthoyl)indole (JWH-200), 5-(1,1-dimethylheptyl)-2-[(1R,3S)-3-hydroxycyclohexyl]-phenol (CP-47,497), and 5-(1,1-dimethyloctyl)-2-[(1R,3S)-3-hydroxycyclohexyl]-phenol (cannabicyclohexanol; CP-47,497 C8 homologue). This intended action is based on a finding by the DEA Deputy Administrator that the placement of

these synthetic cannabinoids into Schedule I of the CSA is necessary to avoid an imminent hazard to the public safety. Finalization of this action will impose criminal sanctions and regulatory controls of Schedule I substances under the CSA on the manufacture, distribution, possession, importation, and exportation of these synthetic cannabinoids.

**FOR FURTHER INFORMATION CONTACT:** Christine A. Sannerud, Ph.D., Chief, Drug and Chemical Evaluation Section, Office of Diversion Control, Drug Enforcement Administration, 8701 Morrisette Drive, Springfield, VA 22152, telephone (202) 307-7183, fax (202) 353-1263, or e-mail [ode@dea.usdoj.gov](mailto:ode@dea.usdoj.gov).

## **SUPPLEMENTARY INFORMATION:**

### **Background**

The Comprehensive Crime Control Act of 1984 (Pub. L. 98-473), which was signed into law on October 12, 1984, amended section 201 of the CSA (21 U.S.C. 811) to give the Attorney General the authority to temporarily place a substance into Schedule I of the CSA for one year without regard to the requirements of 21 U.S.C. 811(b) if he finds that such action is necessary to avoid imminent hazard to the public safety. The Attorney General may extend the temporary scheduling up to six months. A substance may be temporarily scheduled under the emergency provisions of the CSA if it is not listed in any other schedule under section 202 of the CSA (21 U.S.C. 812) or if there is no exemption or approval in effect under 21 U.S.C. 355 for the substance. The Attorney General has delegated his authority under 21 U.S.C. 811 to the Administrator of DEA (28 CFR 0.100). The Administrator has redelegated this function to the Deputy Administrator, pursuant to 28 CFR, appendix to subpart R, section 12.

Section 201(h)(4) of the CSA (21 U.S.C. 811(h)(4)) requires the Deputy Administrator to notify the Assistant Secretary for Health, delegate of the Secretary of Health and Human Services, of her intention to temporarily place a substance into Schedule I of the CSA. Comments submitted by the Assistant Secretary for Health in response to this notification, including whether there is an exemption or approval in effect for the substance in question under the Federal Food, Drug and Cosmetic Act, shall be taken into consideration before a final order is published.

In making a finding that placing a substance temporarily into Schedule I of the CSA is necessary to avoid an imminent hazard to the public safety, the Deputy Administrator is required to consider three of the eight factors set forth in section 201(c) of the CSA (21 U.S.C. 811(c)). These factors are as follows: (4) History and current pattern of abuse; (5) The scope, duration and significance of abuse; and (6) What, if any, risk there is to the public health.

### **Synthetic Cannabinoids**

Synthetic cannabinoids have been developed over the last 30 years for research purposes to investigate the cannabinoid system. No legitimate non-research uses have been identified for these synthetic cannabinoids. They have not been approved by the U.S. Food and Drug Administration for human consumption. These THC-like synthetic cannabinoids, 1-pentyl-3-(1-naphthoyl)indole (JWH-018), 1-butyl-3-(1-naphthoyl)indole (JWH-073), 1-[2-(4-morpholinyl)ethyl]-3-(1-naphthoyl)indole (JWH-200), 5-(1,1-dimethylheptyl)-2-[(1R,3S)-3-hydroxycyclohexyl]-phenol (CP-47,497), and 5-(1,1-dimethyloctyl)-2-[(1R,3S)-3-hydroxycyclohexyl]-phenol (cannabicyclohexanol; CP-47,497 C8 homologue), are so termed for their THC-like pharmacological properties. Though they have similar properties to delta-9- tetrahydrocannabinol (THC) found in marijuana and have been found to be more potent than THC in animal studies. Numerous herbal products have been analyzed and JWH-073, JWH-018, JWH-200, CP-47,497, and cannabicyclohexanol have been identified in varying mixture profiles and amounts spiked on plant material.

### **Factor 4. History and Current Pattern of Abuse**

The emergence of these synthetic cannabinoids represents a recent phenomenon in the designer drug market. Since the initial identification of JWH-018 in December 2008, many additional synthetic cannabinoids with purported psychotropic effects have been identified in related products. The popularity of these THC-like synthetic cannabinoids has greatly increased in the United States and they are being abused for their psychoactive properties. Primarily found laced on plant material, these synthetic cannabinoids are also being abused alone as

self-reported on Internet discussion boards. This abuse has been characterized by both acute and long term public health and safety problems. Even though there is no accepted use for these synthetic cannabinoids, multiple shipments of JWH-018 and JWH-073 have been intercepted by U.S. Customs and Border Protection in 2010, with one being in excess of 50 kilograms. Additionally, bulk loads of JWH-018 and JWH-200 have been seized by law enforcement in 2010. In Casper, Wyoming, products seized in a raid, which were laced with synthetic cannabinoids, were found in conjunction with illicit drugs.

The products containing these THC-like synthetic cannabinoids are marketed as "legal" alternatives to marijuana and are being sold over the Internet and in tobacco and smoke shops, drug paraphernalia shops, and convenience stores. These synthetic cannabinoids alone or spiked on plant material have the potential to be extremely harmful due to their method of manufacture and high pharmacological potency. DEA has been made aware that smoking these synthetic cannabinoids for the purpose of achieving intoxication and experiencing the psychoactive effects is identified as a reason for emergency room visits and calls to poison control centers.

As of October 15, 2010, 15 states in the United States, European and Scandinavian countries have controlled one or more of the synthetic cannabinoids DEA is temporarily scheduling here.

#### **Factor 5. Scope, Duration and Significance of Abuse**

According to forensic laboratory reports, the first appearance of these synthetic cannabinoids in the United States occurred in November 2008, when U.S. Customs and Border Protection analyzed "Spice" products. From January 2010 through September 2010, the National Forensic Laboratory Information System, a national repository of drug evidence analyses from forensic laboratories across the United States, reported over 500 exhibits relating to these synthetic cannabinoids from various States including Alabama, Arkansas, California, Florida, Hawaii, Iowa, Indiana, Kansas, Kentucky, Louisiana, Minnesota, Missouri, North Dakota, Nebraska, Nevada, Oklahoma, Pennsylvania, South Carolina, Tennessee, and Virginia. Additionally, the American Association of Poison Control Centers (AAPCC) has reported receiving over 1,500 calls as of September 27, 2010, relating to products spiked with these synthetic cannabinoids from 48 states and the District of Columbia.

#### **Factor 6. What, if Any, Risk There Is to the Public Health**

JWH-018, JWH-073, JWH-200, CP-47,497, and cannabicyclohexanol share pharmacological similarities with the Schedule I substance THC. Health warnings have been issued by numerous state public health departments and poison control centers describing the adverse health effects associated with these synthetic cannabinoids and their related products including agitation, anxiety, vomiting, tachycardia, elevated blood pressure, seizures, hallucinations and non-responsiveness. Case reports describe psychotic episodes, withdrawal, and dependence associated with use of these synthetic cannabinoids, similar to syndromes observed in cannabis abuse. Emergency room physicians have reported admissions connected to the abuse of these synthetic cannabinoids. Additionally, when responding to incidents involving individuals who have reportedly smoked these synthetic cannabinoids, first responders report that these individuals suffer from intense hallucinations. Detailed chemical analysis by DEA and other investigators have found these synthetic cannabinoids spiked on plant material in products marketed to the general public. The risk of adverse health effects is further increased by the fact that similar products vary in the composition and concentration of synthetic cannabinoids(s) spiked on the plant material.

Self-reported abuse of these THC-like synthetic cannabinoids alone and spiked on plant material appear on Internet discussion boards. According to self-reports, these substances are cannabis-like (or THC-like) in their psychoactive effects and are more potent than THC in this regard. The most common route of administration of these synthetic cannabinoids is by smoking, using a pipe, water pipe, or rolling the drug-spiked plant material in cigarette papers.

The marketing of products that contain one or more of these synthetic cannabinoids is geared towards teens and young adults. Despite disclaimers that the products are not intended for human consumption, retailers promote that routine urinalysis tests will not typically detect the presence of these synthetic cannabinoids.

Furthermore, a number of the products and synthetic cannabinoids appear to originate from foreign sources and are manufactured in the absence of quality controls and devoid of regulatory oversight. These products and associated synthetic cannabinoids are readily accessible via the Internet.

DEA has considered the three criteria for placing a substance into Schedule I of the CSA (21 U.S.C. 812). The data available and reviewed for JWH-073, JWH-018, JWH-200, CP-47,497, and cannabicyclohexanol indicate that these synthetic cannabinoids each have a high potential for abuse, no currently accepted medical use in treatment in the United States and are not safe for use under medical supervision.

Based on the above data, the continued uncontrolled manufacture, distribution, importation, exportation, and abuse of JWH-018, JWH-073, JWH-200, CP-47,497, and cannabicyclohexanol pose an imminent hazard to the public safety. DEA is not aware of any recognized therapeutic uses of these synthetic cannabinoids in the United States. As required by section 201(h)(4) of the CSA (21 U.S.C. 811(h)), the Deputy Administrator in a letter dated October 6, 2010, notified the Assistant Secretary of Health of the intention to temporarily place five synthetic cannabinoids in Schedule I.

In accordance with the provisions of section 201(h) of the CSA (21 U.S.C. 811(h)) and 28 CFR 0.100, the Deputy Administrator has considered the available data and the three factors required to support a determination to temporarily schedule five synthetic cannabinoids: 1- butyl-3-(1-naphthoyl)indole, 1-pentyl-3-(1-naphthoyl)indole, 1-[2-(4-morpholinyl)ethyl]-3-(1-naphthoyl)indole, 5-(1,1-dimethylheptyl)-2- [(1R,3S)-3-hydroxycyclohexyl]-phenol, and 5-(1,1-dimethyloctyl)-2- [(1R,3S)-3-hydroxycyclohexyl]-phenol in Schedule I of the CSA and finds that placement of these synthetic cannabinoids into Schedule I of the CSA is necessary to avoid an imminent hazard to the public safety.

Because the Deputy Administrator finds that it is necessary to temporarily place these synthetic cannabinoids into Schedule I to avoid an imminent hazard to the public safety, the final order, if issued, will be effective on the date of publication of the order in the Federal Register. JWH-018, JWH-073, JWH-200, CP-47,497, and cannabicyclohexanol will be subject to the regulatory controls and administrative, civil and criminal sanctions applicable to the manufacture, distribution, possession, importing and exporting of a Schedule I controlled substance under the CSA. Further, it is the intention of the Deputy Administrator to issue such a final order as soon as possible after the expiration of thirty days from the date of publication of this notice and the date that notification was transmitted to the Assistant Secretary for Health.

### **Regulatory Certifications**

[Editor's Note: See the Federal Register for information regarding Regulatory Certifications.]

### **List of Subjects in 21 CFR Part 1308**

Administrative practice and procedure, Drug traffic control, Reporting and recordkeeping requirements.

Under the authority vested in the Attorney General by section 201(h) of the CSA (**21 U.S.C. 811(h)**), and delegated to the Deputy Administrator of the DEA by Department of Justice regulations (28 CFR 0.100, and section 12 of the Appendix to Subpart R), the Deputy Administrator hereby intends to order that 21 CFR part 1308 be amended as follows:

### **PART 1308--SCHEDULES OF CONTROLLED SUBSTANCES**

1. The authority citation for part 1308 continues to read as follows:

**Authority:** **21 U.S.C. 811, 812, 871(b)**, unless otherwise noted.

2. Section 1308.11 is amended by adding new paragraphs (g)(1), (2), (3), (4), and (5) to read as follows:

#### **Sec. 1308.11 Schedule I.**

\* \* \* \* \*

(g) \* \* \*

(1) 5-(1,1-Dimethylheptyl)-2-[(1R,3S)-3-hydroxycyclohexyl]-phenol- 7297 (Other names: CP-47,497)



- (2) 5-(1,1-Dimethyloctyl)-2-[(1R,3S)-3-hydroxycyclohexyl]-phenol- 7298 (Other names: cannabicyclohexanol and CP-47,497 C8 homologue)
- (3) 1-Butyl-3-(1-naphthoyl)indole-7173 (Other names: JWH-073)
- (4) 1-[2-(4-Morpholinyl)ethyl]-3-(1-naphthoyl)indole-7200 (Other names: JWH-200)
- (5) 1-Pentyl-3-(1-naphthoyl)indole-7118 (Other names: JWH-018 and AM678)

Dated: November 15, 2010.

**Michele M. Leonhart,**  
*Deputy Administrator*

[FR Doc. 2010-29600 Filed 11-23-10; 8:45 am]

BILLING CODE 4410-09-P

\* \* \* \* \*

### **- SCHEDULING UPDATE -**

[Editor's Preface: The following notice has been edited for Microgram Bulletin. See the Federal Register: December 20, 2010 (Volume 75, Number 243) (Rules and Regulations) (Pages 79296-79300) for the complete text.]

#### **DEPARTMENT OF JUSTICE**

#### **Drug Enforcement Administration**

#### **21 CFR Part 1308**

[Docket No. DEA-331F]

#### **Schedules of Controlled Substances: Placement of 5-Methoxy-N,N-Dimethyltryptamine into Schedule I of the Controlled Substances Act**

**AGENCY:** Drug Enforcement Administration (DEA), Department of Justice.

**ACTION:** Final rule.

**SUMMARY:** With the issuance of this final rule, the Deputy Administrator of the Drug Enforcement Administration (DEA) places the substance 5-methoxy-N,N-dimethyltryptamine (5-MeO-DMT), including its salts, isomers and salts of isomers whenever the existence of such salts, isomers, and salts of isomers is possible, into schedule I of the Controlled Substances Act (CSA). This action by the DEA Deputy Administrator is based on a scheduling recommendation from the Assistant Secretary for Health of the Department of Health and Human Services (DHHS) and a DEA review indicating that 5-MeO-DMT meets the criteria for placement in schedule I of the CSA. This final rule will impose the criminal sanctions and regulatory controls of schedule I substances under the CSA on the manufacture, distribution, dispensing, importation, exportation, and possession of 5-MeO-DMT.

**DATES:** Effective Date: January 19, 2011.

**FOR FURTHER INFORMATION CONTACT:** Christine A. Sannerud, PhD, Chief, Drug and Chemical Evaluation Section, Office of Diversion Control, Drug Enforcement Administration, 8701 Morrisette Drive, Springfield, Virginia 22152, Telephone: (202) 307-7183.

## **SUPPLEMENTARY INFORMATION:**

### **Background**

In accordance with 21 U.S.C. 811(b) of the CSA, DEA gathered and reviewed the available information regarding the pharmacology, chemistry, trafficking, actual abuse, pattern of abuse, and the relative potential for abuse of 5-methoxy-N,N-dimethyltryptamine (5- MeO-DMT). On February 21, 2007, the Deputy Administrator of the DEA submitted these data to the Assistant Secretary for Health, Department of Health and Human Services. In accordance with 21 U.S.C. 811(b), the Deputy Administrator also requested a scientific and medical evaluation and a scheduling recommendation for 5-MeO-DMT from the Assistant Secretary for Health.

5-MeO-DMT is related to the schedule I hallucinogens N,N- dimethyltryptamine (DMT), 2,5-dimethoxy-4-methylamphetamine (DOM), lysergic acid diethylamide (LSD) and mescaline in its pharmacological properties and hallucinogenic effects. In animal drug discrimination studies, DOM, LSD, mescaline, DMT, and alpha-methyltryptamine (AMT) fully substitute for the discriminative stimulus cue of 5-MeO-DMT. In in vitro receptor binding studies, 5-MeO-DMT, similar to DMT and other schedule I hallucinogens, binds to central serotonin 2 (5 - HT<sub>2</sub>) receptors. Anecdotal reports from humans who have used 5-MeO-DMT describe hallucinogenic effects similar to those produced by DMT. 5-MeO-DMT, however, is reported to be 4 to 5-fold more potent than DMT when administered by inhalation, sublingual or oral (if encapsulated) routes of administration.

Evidence of 5-MeO-DMT trafficking was first reported in 1999 by Federal law enforcement officials. Though 5-MeO-DMT is likely to be underreported because it is not a controlled substance, from January 1999 to December 2009, law enforcement officials encountered 23 cases involving 35 drug exhibits pertaining to the trafficking, distribution and abuse of 5-MeO-DMT, according to the System to Retrieve Information from Drug Evidence (STRIDE), a Federal database of drug exhibits analyzed by DEA laboratories. The drug exhibits analyzed by DEA laboratories comprised 89 grams of powder and 10 milliliters of liquid containing 5-MeO-DMT. From January 2004 to December 2009, the National Forensic Laboratory Information System (NFLIS), a database of drug analyses conducted by State and local forensic laboratories, reported 27 State and local drug cases involving 32 drug exhibits identified as 5-MeO-DMT.

The risks to the public health associated with the abuse of 5-MeO- DMT are similar to the risks associated with those of schedule I hallucinogens. There have been reports of emergency room admissions and a death associated with the abuse of 5-MeO-DMT. 5-MeO-DMT has never been approved by the Food and Drug Administration (FDA) for marketing as a human drug product in the United States and there are no recognized therapeutic uses of 5-MeO-DMT in the United States.

### **Notice of Proposed Rulemaking**

On December 18, 2008, the Principal Deputy Assistant Secretary for Health, Department of Health and Human Services (DHHS), sent the Deputy Administrator of the DEA a scientific and medical evaluation and a letter recommending that 5-MeO-DMT and its salts be placed into schedule I of the CSA. Enclosed with the letter was a document prepared by FDA entitled, "Basis for the Recommendation To Control 5-Methoxy-Dimethyltryptamine (5-MeO-DMT) in Schedule I of the Controlled Substances Act." The document contained a review of the factors which the CSA requires the Secretary to consider (21 U.S.C. 811(b)).

After a review of the available data, including the scientific and medical evaluation and the scheduling recommendation from DHHS, the Deputy Administrator of the DEA published a Notice of Proposed Rulemaking entitled "Schedules of Controlled Substances: Placement of 5-Methoxy-Dimethyltryptamine into Schedule I of the Controlled Substances Act" on August 21, 2009 (74 FR 42217), which proposed placement of 5-MeO-DMT in schedule I of the CSA. The proposed rule provided an opportunity for all interested persons to submit their written comments on or before September 21, 2009.

After the comment period closed on September 21, 2009, DEA discovered that the supporting documents referenced in the proposed rule were not posted to the electronic docket, thus not available for review. DEA reopened the public comment period (October 28, 2009, Notice of Proposed Rulemaking) (74FR55502) for an additional 30 days to ensure all interested members of the public had an opportunity to review all the materials and provide comments. Comments submitted on or before November 27, 2009, were considered.

## Comments Received

[Editor's Note: See the Federal Register for comments received and DEA's response to said comments.]

## Scheduling of 5-MeO-DMT

Based on the recommendation of the Assistant Secretary for Health, received in accordance with section 201(b) of the Act (21 U.S.C. 811(b)), the independent review of the available data by DEA, and after a review of the comments received in response to the Notice of Proposed Rulemaking and the notice reopening the comment period, the Deputy Administrator, pursuant to sections 201(a) and 201(b) of the Act (21 U.S.C. 811(a) and 811(b)), finds that:

- (1) 5-MeO-DMT has a high potential for abuse.
- (2) 5-MeO-DMT has no currently accepted medical use in treatment in the United States.
- (3) There is a lack of accepted safety for use of 5-MeO-DMT under medical supervision.

Based on these findings, the Deputy Administrator of the DEA concludes that 5-MeO-DMT and its salts warrant control in schedule I of the CSA (21 U.S.C. 812 (b)(1)).

## Regulatory Requirements

[Editor's Note: See the Federal Register for all regulatory requirements.]

## Regulatory Certifications

[Editor's Note: See the Federal Register for all regulatory certifications.]

## PART 1308--SCHEDULES OF CONTROLLED SUBSTANCES

- The authority citation for part 1308 continues to read as follows:  
Authority: **21 U.S.C. 811, 812, 871(b)** unless otherwise noted.
- **Section 1308.11** is amended by:
- A. Redesignating existing paragraphs (d)(15) through (d)(34) as paragraphs (d)(16) through (d)(35); and
- B. Adding a new paragraph (d)(15).

### Sec. 1308.11 Schedule I.

\* \* \* \* \*

(d) \* \* \*

(15) 5-methoxy-N,N-dimethyltryptamine 7431. Some trade or other names: 5-methoxy-3-[2-(dimethylamino)ethyl]indole; 5-MeO-DMT

\* \* \* \* \*

Dated: December 13, 2010.

**Michele M. Leonhart,**  
*Deputy Administrator.*

[FR Doc. 2010-31854 Filed 12-17-10; 8:45 am]

BILLING CODE 4410-09-P

## SELECTED REFERENCES

[The Selected References section is a compilation of recent publications of presumed interest to forensic chemists. Unless otherwise stated, all listed citations are published in English. Abbreviated mailing address information duplicates that which is provided by the abstracting service. Patents and Proceedings are reported only by their *Chemical Abstracts* citation number.]

1. Ali EMA, Edwards HGM, Hargreaves MD, Scowen IJ. **In situ detection of cocaine hydrochloride in clothing impregnated with the drug using benchtop and portable Raman spectroscopy.** *Journal of Raman Spectroscopy* 2010;41(9):938-943. [Editor's Notes: Presents title study. Contact: Raman Spectroscopy Group, University Analytical Centre, Division of Chemical and Forensic Sciences, University of Bradford, Bradford BD7 1DP, United Kingdom.]
2. Awad T, Belal T, Maher HM, De Ruiter J, Clark CR. **GC-MS studies on side chain regioisomers related to substituted methylenedioxyphenethylamines: MDEA, MDMMA, and MBDB.** *Journal of Chromatographic Science* 2010;48(9):726-732. [Editor's Notes: Presents title study. Contact: Division of Medicinal Chemistry, Harrison School of Pharmacy, Auburn University, Auburn, AL 36849, USA.]
3. Brandt SD, Moore SA, Freeman S, Kanu AB. **Characterization of the synthesis of N,N-dimethyltryptamine by reductive amination using gas chromatography ion trap mass spectrometry.** *Drug Testing and Analysis* 2010;2(7):330-338. [Editor's Notes: This study established an impurity profile of a synthetic route to N,N-dimethyltryptamine (DMT). The synthesis was carried out under reductive amination conditions between tryptamine and aqueous formaldehyde in the presence of acetic acid followed by reduction with sodium cyanoborohydride. Analytical characterization of this synthetic route was carried out by gas chromatography ion trap mass spectrometry using electron- and chemical-ionization modes. Methanol was employed as a liquid CI reagent and the impact of stoichiometric modifications on side-products formation was also investigated. Tryptamine 1, DMT 2, 2-methyltetrahydro-b-carboline (2-Me-THBC, 3), N-methyl-N-cyanomethyltryptamine (MCMT, 4), N-methyltryptamine (NMT, 5), 2-cyanomethyl-tetrahydro-b-carboline (2-CM-THBC, 6), and tetrahydro-b-carboline (THBC, 7) have been detected under a variety of conditions. Contact: School of Pharmacy and Biomolecular Sciences, Liverpool John Moores University, Liverpool L3 3AF, United Kingdom.]

### Additional References of Possible Interest:

1. Hurley JM, West JB, Ehleringer JR. **Stable isotope models to predict geographic origin and cultivation conditions of marijuana.** *Science & Justice* 2010;50(2):86-93. [Editor's Notes: The study describes stable isotope based models using hydrogen and carbon isotope ratios to predict geographic region-of-origin and growth environment for marijuana, with the intent of applying these models to analyses of marijuana trafficking in the USA. The models were developed on the basis of eradication specimens and border specimens seized throughout the USA. We tested reliability of the geographic region-of-origin and growth environment models with a "blind" set of 60 marijuana eradication specimens obtained from counties throughout the USA. We demonstrate

here that stable isotope ratio analysis of marijuana seizures can significantly improve our understanding of marijuana distribution networks and it is for that purpose that these models were developed. Contact: Department of Biology, University of Utah, Salt Lake City, UT 84112, USA.]

2. Lee EJ, Hwang IK, Kim NY, Lee KL, Han MS, Lee YH, Kim MY, Yang MS. **An assessment of the utility of universal and specific genetic markers for opium poppy identification.** Journal of Forensic Sciences 2010;55(5):1202-1208. [Editor's Notes: Presents title study. Contact: DNA Analysis Sector, Western District Office, National Institute of Scientific Investigation 111 Daeduk-Ri, Seosam-Myun, Jangsung-Gun, Chonnam 515-822, S. Korea.]
3. Mehmedic Z, Chandra S, Slade D, Denham H, Foster S, Patel AS, Ross SA, Khan IA, El Sohly MA. **Potency trends of  $\Delta^9$ -THC and other cannabinoids in confiscated cannabis preparations from 1993 to 2008.** Journal of Forensic Sciences 2010;55(5):1209-1217. [Editor's Notes: Presents title study. Contact: National Center for Natural Products Research, School of Pharmacy, University of Mississippi, University, MS 38677, USA.]

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## THE JOURNAL/TEXTBOOK COLLECTION EXCHANGE

The Journal/Textbook Collection Exchange is a service intended to facilitate the transfer of unwanted journals and textbooks to forensic libraries or other *Microgram* subscribers. The current donations are listed below. The offers are First Come/First Serve (except libraries have preference). There are no charges to the requestor. Please provide a full mailing address in the request.

### *Journal of Forensic Sciences:*

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 1993: January (#1), March (#2), May (#3), July (#4), September (#5)  
 1998: September (#5)  
 2000: January (#1), March (#2), May (#3), July (#4), September (#5)  
 2001: Complete set  
 2002: Complete set  
 2003: Complete set  
 2004: Complete set  
 2007: January (#1), March (#2), November (#6)

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1999: December (#2)  
 2000: January (#1-2)

All subscribers are encouraged to donate surplus or unwanted items/collections. Reference texts and long runs of forensic/analytical journals are of particular interest; however, even single issues are worthwhile, and may fill a hole in an existing collection. If interested, please consult the *Microgram* website or contact the *Microgram* Editor for further instructions.

## THE DEA FY 2011 STATE AND LOCAL FORENSIC CHEMISTS SEMINAR SCHEDULE

The FY 2011 schedule for the State and Local Forensic Chemists Seminar is as follows:

March 7-11, 2011  
June 6-10, 2011  
September 12-16, 2011

The school is open only to forensic chemists working for law enforcement agencies. It is intended for chemists who have completed their agency's internal training program and have also been working on the bench for at least one year. There is no tuition charge. The course is held at the Hyatt Place Dulles North Hotel in Sterling, Virginia (near the Washington/Dulles International Airport). A copy of the application form is reproduced on the last page of this issue of *Microgram Bulletin*. Completed applications should be mailed to the Special Testing and Research Laboratory (Attention: J. Head) at 22624 Dulles Summit Court, Dulles, VA 20166. For additional information, call (703) 668-3349.

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### SCIENTIFIC MEETINGS

**Title:** American Academy of Forensic Sciences 2011 Annual Meeting  
**Sponsoring Organization:** American Academy of Forensic Sciences  
**Inclusive Dates:** February 21-26, 2011  
**Location:** Hyatt Regency (Chicago, IL)  
**Contact Information:** [See website](#)  
**Website:** [www.aafs.org](http://www.aafs.org)

\* \* \* \* \*

### MICROGRAM EMAIL ADDRESS CHANGE

Effective January 1, 2011, the email address for the *Microgram* Editor will be:

[DEA-Microgram-at-usdoj.gov](mailto:DEA-Microgram-at-usdoj.gov) (Replace “-at-” with “@”)

The current email address ([dea-microgram-2010-at-mailsnare.net](mailto:dea-microgram-2010-at-mailsnare.net)) will be monitored until January 31, 2011. An automated response will direct senders to the new address until April 1, 2011, at which point the account will lapse.

**Important Notes to All Subscribers:** All subscribers with filters on their accounts should immediately “whitelist” the [DEA-Microgram-at-usdoj.gov](mailto:DEA-Microgram-at-usdoj.gov) email address. In addition, it is recommended that the current and previous email addresses used for *Microgram* ([dea-microgram-2010-at-mailsnare.net](mailto:dea-microgram-2010-at-mailsnare.net)) be automatically filtered (blocked) after January 1, 2011. This address will no longer be used by *Microgram* after this date; therefore, any subsequent emails from any previous *Microgram* email address will be spam.

All subscribers should notify their IT security personnel of all the above changes.



## Information and Instructions for *Microgram Bulletin*

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*Microgram Bulletin* and *Microgram Bulletin LE* are monthly newsletters published by the U.S. Drug Enforcement Administration's Office of Forensic Sciences. *Microgram Bulletin* is primarily intended to provide up-to-date content of interest to the forensic community including Drug Scheduling Updates, Safety Alerts, Selective Literature References, Meeting Announcements, Employment Opportunities, The Journal and Textbook Collection Exchange, and Training Opportunities. *Microgram Bulletin LE* is primarily intended to assist and serve forensic scientists concerned with the detection and analyses of suspected controlled substances for forensic/law enforcement purposes. It also features Intelligence Alerts and Briefs, in addition to the content found in *Microgram Bulletin*.

### Access to *Microgram Bulletin* and *Microgram Bulletin LE*

*Microgram Bulletin* is posted at [www.dea.gov](http://www.dea.gov). *Microgram Bulletin LE* is posted at [www.leo.gov](http://www.leo.gov) in the DEA Special Interest Group (SIG) and the Department of Justice's information exchange website (IDEA). *Microgram Bulletin* and *Microgram Bulletin LE* are available only on the internet. Professional scientific and law enforcement personnel may request email notifications when new issues are posted (such notifications are not available to private citizens). The publications themselves are never sent electronically (that is, as attachments or hyperlinks).

Requests to be added to the email notification list should be submitted via email to the *Microgram* Editor at: [DEA-Microgram -at- usdoj.gov](mailto:DEA-Microgram-at-usdoj.gov). Requests can also be mailed to: DEA Headquarters; Attn: Office of Forensic Sciences/Microgram Editor; 8701 Morrisette Drive; Springfield, VA 22152. All requests to be added to the *Microgram* email notification list should include the following Standard Contact Information:

- The Full Name and Mailing Address of Submitting Laboratory or Office;
- The Full Name, Title (Laboratory Director, Assistant Special Agent in Charge, Librarian, etc.), Phone Number, FAX Number, and Preferred email Address of the Submitting Individual (Note: that email notifications are mailed to titles, not names, in order to avoid problems arising from future personnel changes);
- If available, the generic email address for the Submitting Laboratory or Office;
- If a generic email address is not available, one email address for an individual who is likely to be a long-term employee, who has a stable email address, and who will be responsible for forwarding *Microgram* information to all of the other employees in the requestor's Office (Note that only one email address per Office will be honored).

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Access to *Microgram Bulletin* and *Microgram Bulletin LE* is free.

### **Submissions to *Microgram Bulletin* and *Microgram Bulletin LE***

*Microgram Bulletin* includes Safety Alerts, Selected Literature References, Meeting Announcements, Employment Opportunities, pertinent sections from the Code of Federal Regulations, Columns of topical importance, and similar material of interest to the general forensic community. *Microgram Bulletin LE* will also feature Intelligence Alerts and Briefs, in addition to the content found in *Microgram Bulletin*. Explanatory details for most of the above types of submission are detailed below, and typical examples are published in most issues of *Microgram Bulletin* or *Microgram Bulletin LE*.

All submissions must be in English. Although *Microgram Bulletin LE* is classified as law enforcement sensitive, case sensitive information should not be submitted. All submissions should, whenever possible, be submitted electronically, as straight email or as an PC-compatible Microsoft Word® attachment, to: [DEA-Microgram -at- usdoj.gov](mailto:DEA-Microgram-at-usdoj.gov). Current versions of Microsoft Word® (defined as having release dates less than 5 years old) should be utilized. If email submission is not possible, submissions may be mailed to: DEA Headquarters; Attn: Office of Forensic Sciences/Microgram Editor; 8701 Morrisette Drive; Springfield, VA 22152. Hard copy mailings should be accompanied by an electronic version on an PC-compatible standard CD-R. **Note that diskettes should be mailed in an irradiation -proof protective sleeve, and the mailing envelope should be marked: “Warning - Contains Electronic Media - Do Not Irradiate”.** Note also that mailed submissions may be subject to lengthy handling delays beyond the control of the Office of Forensic Sciences, and electronic media sent through the mail may be destroyed en route by sanitizing procedures, despite protective measures and written warnings. All submissions should include the following **Contact Information:** The Full Name and Address of Submitting Laboratory or Office, and the Full Name, Phone Number, FAX Number, and Preferred email address of the Submitting Individual.

**Safety Alerts** are urgent communiqués to the *Microgram Bulletin* readership which give notice of a specific safety issue of particular interest to forensic or crime laboratory personnel, or to law enforcement personnel dealing with controlled substances. They should include a concise synopsis of the incident(s), recommendations (if any), pertinent literature citations (if any are known), and a mechanism for providing feedback (if appropriate).

**Selected Literature References** is a monthly compilation of reference citations of presumed interest to the *Microgram Bulletin* readership, derived from approximately 7,500 scientific periodicals. The focus of the Selected Literature References is the detection and analysis of suspected controlled substances for forensic/law enforcement purposes. References from clinical and toxicological journals are included only if the material is considered to be of high interest to forensic chemists (for example, contains the mass spectra of an unusual substance that is not known to be published elsewhere). Note that citations from obscure periodicals may be missed, and all *Microgram Bulletin* subscribers are invited to submit citations of interest if they do not appear in *Microgram Bulletin* within three months of their publication. Of

particular interest are articles from regional forensic science associations that are unlikely to be noted by any abstracting service. Citations should include a summary sentence and the primary author's contact information.

**Meeting Announcements** list upcoming meetings of presumed interest to the *Microgram Bulletin* readership. In general, only meetings which are dedicated to forensic chemistry/forensic drug analysis or include a subsection so dedicated will be publicized in *Microgram Bulletin*. Meeting Announcements should include the Formal Title, Sponsoring Organization, Inclusive Dates, Location (City, State, and specific locale), Registration Deadline, Recommended Hotel (include details on special rates and deadlines where applicable), and Contact Individual's Name, Phone Number, and email Address. If available, the URL for the meeting website should also be included in the Announcement.

**Employment Opportunities** lists job announcements of presumed interest to the *Microgram Bulletin* readership. In general, only jobs with a forensic chemistry/forensic drug analysis focus for Federal, State, or Local Crime Laboratories or Offices will be publicized in *Microgram Bulletin*. Exceptions may be requested and will be considered on a case-by-case basis (for example, an academic position in a Forensic Chemistry Department). Employment Opportunity announcements should include the Formal Title of the Organization, Formal Title of the Laboratory or Office, Position Title, Laboratory or Office Location (City and State), Salary Range, Opening and Closing Dates, Duties, General Requirements, Specialized Requirements (if any), Application Procedures, and the Contact Individual's Name, Phone Number, email Address, and Mailing Address. If available, the URL for the agency's website, and (if available) the specific URL for the job posting should also be included in the Announcement. Employment Opportunities will typically be posted for 3 consecutive months, but not past the application deadline.

### **The Journal/Textbook Collection Exchange**

If any subscriber is interested in donating any forensic or analytical chemistry journal and/or textbook collection to a fellow subscriber or library, *Microgram Bulletin* is willing to list the offered materials and the associated contact information in a future issue. The general format should follow the example in the January 2003 issue, and should be sent via email to the *Microgram* Editor at: [DEA-Microgram-at-usdoj.gov](mailto:DEA-Microgram-at-usdoj.gov). Only items for donation (not for sale) will be considered for publication, and donations to libraries should adhere to journal restrictions and/or time limits (if any) on such offers.

**Intelligence Alerts and Briefs** (*Microgram Bulletin LE* only) are concise synopses of the physical and chemical characteristics of novel and/or interesting exhibits submitted to law enforcement laboratories involved in the detection and analyses of suspected controlled substances for forensic/law enforcement purposes. Alerts have some unusual aspect, such as a novel drug, an atypical formulation, or a new smuggling technique, whereas Briefs are reports of routine analyses (that is, that confirmed what was suspected/expected). Both Alerts and Briefs should include descriptive details adhering to (as appropriate) the following outline:

- What laboratory did the analysis? (Full Name)
- Where is the laboratory located?
- What agency seized the exhibit?
- Where was the exhibit seized? (If an obscure locale, give distance and direction from the nearest city)

- Were there any interesting (but non-sensitive) aspects of the seizure (traffic stop, unusual smuggling technique, at a “Rave,” etc.)
- What controlled substance was suspected upon submission?
- Detailed physical description (appearance, dimensions, logos, odor, packaging, etc.)
- Quantities (numbers of tablets, packages or bricks, average mass, total net mass, etc.)
- Photos (see additional information, below)
- What techniques were used to analyze the exhibit?
- Actual composition of the exhibit?
- Quantitation data? (if not quantitated, provide a qualitative approximation if possible)
- Adulterants and diluents? (if identified, especially if unusual)
- First seizure of this type? (if not, provide brief details of previous examples)
- Editorial comments? (if any)
- Literature references for unusual submissions? (if needed)

In order to avoid confusion, if uncommon controlled substances are identified, the description should use the full chemical name(s) of the identified substances (if desired, acronyms or street terminology (e.g., “Foxy-Methoxy”, “Nexus”, or “STP”) can be included in parentheses after the full chemical name).

Please provide photographs as attachments and not as images embedded in documents. JPEG images are preferred. Photographs should be of reasonable size. Unless the scale is obvious, photographs of subject exhibit(s) should include either a metric ruled scale or a coin or bill (U.S. currency) to place the exhibit’s size in context.

**Selected Intelligence Briefs** (*Microgram Bulletin LE* only) are reprinted (with permission) unclassified intelligence briefs of presumed interest to the *Microgram Bulletin LE* readership that have been previously published in restricted or nonrestricted publications or websites that are also dedicated to the detection and analyses of suspected controlled substances for forensic/ law enforcement purposes. Selected Intelligence Briefs must be unclassified, and should be a minimum of 1 page and a maximum of 10 pages in length (single spaced at 11 pitch Times New Roman font, including photos, tables, charts, etc.). All *Microgram Bulletin LE* subscribers are invited to submit such material, which must include the author’s and publisher’s contact information.

#### **Requests for *Microgram* and/or *Microgram Bulletin* Archives, 1967 - 2002**

All issues of *Microgram* (November 1967 - March 2002) and the first nine issues of its successor *Microgram Bulletin* (April - December 2002) were and continue to be **Law Enforcement Restricted** publications, and are therefore (permanently) unavailable to the general public. [Note that this restriction includes requests made under the Freedom of Information (FOI) Act.]

However, the entire collection, individual issues, or individual sections of issues (e.g., specific articles) are available to law enforcement affiliated offices and laboratories. Requests from such offices and laboratories must be made on official letterhead and mailed to:

DEA Headquarters  
Attn: Office of Forensic Sciences/*Microgram* Editor  
8701 Morrisette Drive  
Springfield, VA 22152.

Requests will be sent either by CD or in hard copy (photocopy), as appropriate.

Note that requests made via email will not be honored.

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## DISCLAIMERS

- 1) All material published in *Microgram Bulletin*, *Microgram Bulletin LE*, and *Microgram Journal* is reviewed prior to publication. However, the reliability and accuracy of all published information are the responsibility of the respective contributors, and publication in *Microgram Bulletin*, *Microgram Bulletin LE*, and/or *Microgram Journal* implies no endorsement by the United States Department of Justice or the Drug Enforcement Administration.
- 2) Due to the ease of scanning, copying, electronic manipulating, and/or reprinting, only the posted copies of *Microgram Bulletin*, *Microgram Bulletin LE*, and *Microgram Journal* at [www.leo.gov](http://www.leo.gov), the Department of Justice's information exchange website (IDEA), and [www.dea.gov](http://www.dea.gov) are valid. All other copies, whether electronic or hard, are suspect unless verified against the posted versions.
- 3) **WARNING!:** Due to the often lengthy time delays between the actual dates of seizures and their subsequent reporting in *Microgram Bulletin*, *Microgram Bulletin LE*, and/or *Microgram Journal*, and also because of the often wide variety of seizure types with superficially similar physical attributes, published material cannot be utilized to visually identify controlled substances currently circulating in clandestine markets. **The United States Department of Justice and the Drug Enforcement Administration assume no liability for the use or misuse of the information published in *Microgram Bulletin*, *Microgram Bulletin LE*, and/or *Microgram Journal*.**

<b>DEA State and Local Forensic Chemist Seminar Application</b>			
Name: (PRINT NAME EXACTLY AS IT IS TO APPEAR ON CERTIFICATE)		Title:	
Employer:			
Your Office Mailing Address (include city, state, and zipcode):			Length of Service:
Business Telephone: (     )     -	Business Fax: (     )     -	Date of Application:	
Email Address:			
Education			
College or University	Degree	Major	
Please Check Which Techniques or Equipment Are Used in Your Laboratory			
<input type="checkbox"/>	Color Tests	<input type="checkbox"/>	UV
<input type="checkbox"/>	Column Chromatography	<input type="checkbox"/>	IR
<input type="checkbox"/>	Microcrystal Tests	<input type="checkbox"/>	CE
<input type="checkbox"/>	Thin Layer Chromatography	<input type="checkbox"/>	GC/MS
<input type="checkbox"/>	GC	<input type="checkbox"/>	Other (please specify)
<input type="checkbox"/>	HPLC	<input type="checkbox"/>	Other (please specify)
Indicate Analytical Problem(s) Nominee Would Like to Have Covered:			
Choice of Seminar Dates:			
1st Choice:		2nd Choice:	
Laboratory Chief/Director:			
Printed Name: _____		Signature: _____	
Title: _____		Date: _____	
Phone: _____			





# Microgram

## *Bulletin*

Published by:

The Drug Enforcement Administration  
Office of Forensic Sciences  
Washington, DC 20537

The U.S. Attorney General has determined that the publication of this periodical is necessary in the transaction of the public business required by the Department of Justice. Information, instruction, and disclaimers are published in the January issues.

- FEBRUARY 2011 -

### SELECTED REFERENCES

[The Selected References section is a compilation of recent publications of presumed interest to forensic chemists. Unless otherwise stated, all listed citations are published in English. Abbreviated mailing address information duplicates that which is provided by the abstracting service. Patents and Proceedings are reported only by their *Chemical Abstracts* citation number.]

1. Debrus B, Broseus J, Guillarme D, Lebrun P, Hubert P, Veuthey JL, Esseiva P, Rudaz S. **Innovative methodology to transfer conventional GC-MS heroin profiling to UHPLC-MS/MS.** *Analytical and Bioanalytical Chemistry* **2010**, No pp. yet given. [Editor's Notes: Presents title study. Contact: Laboratory of Analytical Chemistry, Department of Pharmacy, CIRM, University of Liege, Liege 4000, Belgium.]
2. Tadjimukhamedov FK, Jackson AU, Nazarov EG, Ouyang Z, Cooks RG. **Evaluation of a Differential Mobility Spectrometer/Miniature Mass Spectrometer System.** *Journal of the American Society for Mass Spectrometry* 2010;21(9):1477-1481. [Editor's Notes: A planar differential mobility spectrometer (DMS) was coupled to a Mini 10 hand-held rectilinear ion trap (RIT) mass spectrometer (MS) (total wt. 10 kg), and the performance of the instrument was evaluated using illicit drug analysis. Online ion mobility filtering showed to be advantageous in reducing the background chemical noise in the analysis of the psychotropic drug diazepam. The additional separation power of DMS facilitated the identification of 2 drugs of similar molecular weight,

morphine (MW = 285.34), and diazepam (MW = 284.70), using a miniature mass spectrometer capable of unit resolution. The similarity in the proton affinities of these 2 compounds resulted in some cross-interference in the MS data due to facile ionization of the neutral form of the compounds even when the ionic form had been separated by DMS. Contact: Department of Chemistry, Purdue University, West Lafayette, IN 49707-1393, USA.]

#### **Additional References of Possible Interest:**

1. Idris AM. **Flow Injection, Overlooked Techniques in Forensic Analysis.** Critical Reviews in Analytical Chemistry 2010;40(4):218-225. [Editor's Notes: The objective of the article is to draw attention to the potential of Flow Injection (FI) techniques to forensic analytical chemists. The article provides a comprehensive review of the applications of FI techniques to forensic chemical analysis, which covers the literature since the inception of the techniques. The article also offers a brief historical background on the developments of the generation and versions of the techniques while highlighting their advantages. In addition, perspectives on the applications of FI techniques to forensic analysis are discussed. Contact: Department of Chemistry, College of Science, King Faisal University, Hofuf, Saudi Arabia.]
2. Neng NR, Silva ARM, Nogueira JMF. **Adsorptive Micro-extraction Techniques - Novel Analytical Tools for Trace Levels of Polar Solutes in Aqueous Media.** Journal of Chromatography, A 2010;1217(47):7303-7310. [Editor's Notes: Presents title study. Contact: University of Lisbon, Faculty of Sciences, Chemistry and Biochemistry Department, Campo Grande, Center of Chemistry and Biochemistry, Ed. C8, Lisbon 1749-016, Portugal.]

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#### **THE JOURNAL/TEXTBOOK COLLECTION EXCHANGE**

The Journal/Textbook Collection Exchange is a service intended to facilitate the transfer of unwanted journals and textbooks to forensic libraries or other *Microgram* subscribers. The current donations are listed below. The offers are First Come/First Serve (except libraries have preference). There are no charges to the requestor. Please provide a full mailing address in the request.

*Analytical Chemistry* (Microfilm) 1990; Vol. 62 to 2000; Vol. 72  
*Arzneimittel Forschung* (Microfilm) 1973; Vol. 23 to 1999; Vol. 49  
*Forensic Science International* (Microfilm) 1972; Vol. 1 to 1976; Vol. 8  
*Forensic Science International* (Microfilm) 1983; Vol. 21 to 1996; Vol. 83  
*Journal of Chromatography* (Microfilm) 1958; Vol. 1 to 1993; Vol. 622  
*Journal of Chromatography A* (Microfilm) 1993; Vol. 652 to 2001; Vol. 921  
*Journal of Chromatography B* (Microfilm) 1994; Vol. 652 to 2004; Vol. 813  
*Journal of Forensic Sciences* (Microfilm) 1956; Vol. 1 to 1977; Vol. 22  
*Journal of Forensic Sciences* (Microfilm) 1985; Vol. 30 to 1996; Vol. 41  
*Journal of Pharmacy and Pharmacology* (Microfilm) 1965; Vol. 17 to 1987; Vol. 39  
*Science* (Microfilm) 1998; Vol. 279 to 2004; Vol. 306

All subscribers are encouraged to donate surplus or unwanted items/collections. Reference texts and long runs of forensic/analytical journals are of particular interest; however, even single issues are worthwhile, and may fill a hole in an existing collection. If interested, please consult the *Microgram* website or contact the *Microgram* Editor for further instructions.

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## THE DEA FY 2011 STATE AND LOCAL FORENSIC CHEMISTS SEMINAR SCHEDULE

The FY 2011 schedule for the State and Local Forensic Chemists Seminar is as follows:

June 6-10, 2011  
September 12-16, 2011

The school is open only to forensic chemists working for law enforcement agencies. It is intended for chemists who have completed their agency's internal training program and have also been working on the bench for at least one year. There is no tuition charge. The course is held at the Hyatt Place Dulles North Hotel in Sterling, Virginia (near the Washington/Dulles International Airport). A copy of the application form is reproduced on the last page of this issue of *Microgram Bulletin*. Completed applications should be mailed to the Special Testing and Research Laboratory (Attention: J. Head) at 22624 Dulles Summit Court, Dulles, VA 20166. For additional information, call (703) 668-3349.

\* \* \* \* \*

## SCIENTIFIC MEETINGS

**Title:** 2011 Mid-Atlantic Association of Forensic Scientists Annual Meeting  
**Sponsoring Organization:** Mid-Atlantic Association of Forensic Scientists  
**Inclusive Dates:** May 23-27, 2011  
**Location:** Founder's Inn and Spa (Virginia Beach, VA)  
**Contact Information:** [maafsmtg@gmail.com](mailto:maafsmtg@gmail.com)  
**Website:** [www.maafs.org](http://www.maafs.org)

<b>DEA State and Local Forensic Chemist Seminar Application</b>			
Name: (PRINT NAME EXACTLY AS IT IS TO APPEAR ON CERTIFICATE)		Title:	
Employer:			
Your Office Mailing Address (include city, state, and zipcode):			Length of Service:
Business Telephone: (     )     -	Business Fax: (     )     -	Date of Application:	
Email Address:			
Education			
College or University	Degree	Major	
Please Check Which Techniques or Equipment Are Used in Your Laboratory			
<input type="checkbox"/>	Color Tests	<input type="checkbox"/>	UV
<input type="checkbox"/>	Column Chromatography	<input type="checkbox"/>	IR
<input type="checkbox"/>	Microcrystal Tests	<input type="checkbox"/>	CE
<input type="checkbox"/>	Thin Layer Chromatography	<input type="checkbox"/>	GC/MS
<input type="checkbox"/>	GC	<input type="checkbox"/>	Other (please specify)
<input type="checkbox"/>	HPLC	<input type="checkbox"/>	Other (please specify)
Indicate Analytical Problem(s) Nominee Would Like to Have Covered:			
Choice of Seminar Dates:			
1st Choice:		2nd Choice:	
Laboratory Chief/Director:			
Printed Name: _____		Signature: _____	
Title: _____		Date: _____	
Phone: _____			



# Microgram

## *Bulletin*

**Published by:**

**The Drug Enforcement Administration  
Office of Forensic Sciences  
Washington, DC 20537**

**The U.S. Attorney General has determined that the publication of this periodical is necessary in the transaction of the public business required by the Department of Justice. Information, instruction, and disclaimers are published in the January issues.**

**- MARCH 2011 -**

**- SCHEDULING UPDATE -**

[Editor's Preface: The following notice has been edited for *Microgram Bulletin*. See the Federal Register: March 1, 2011, (Volume 76, Number 40) (Rules and Regulations) (Pages 11075-11078) for the complete text of the final order.]

**DEPARTMENT OF JUSTICE**

**Drug Enforcement Administration**

**21 CFR Part 1308**

**[Docket No. DEA-345F]**

**Schedules of Controlled Substances: Temporary Placement of Five Synthetic Cannabinoids Into Schedule I**

**AGENCY:** Drug Enforcement Administration (DEA), U.S. Department of Justice.

**ACTION:** Final order.

**SUMMARY:** The Administrator of the Drug Enforcement Administration (DEA) is issuing this final order to temporarily place five synthetic cannabinoids into the Controlled Substances Act (CSA) pursuant to the temporary scheduling provisions. The substances are 1-pentyl-3-(1-naphthoyl)indole (JWH-018), 1-butyl-3-(1-naphthoyl)indole (JWH-073), 1-[2-(4-morpholinyl)ethyl]-3-(1-naphthoyl)indole (JWH-200), 5-(1,1-dimethylheptyl)-2-[(1R,3S)-3-hydroxycyclohexyl]-phenol (CP-47,497), and 5-(1,1-dimethyloctyl)-2-[(1R,3S)-3-hydroxycyclohexyl]-phenol (cannabicyclohexanol; CP-47,497 C8 homologue). This action is based on a finding by the Administrator that the placement of these synthetic cannabinoids into Schedule I of the CSA is necessary

to avoid an imminent hazard to the public safety. As a result of this order, the full effect of the CSA and its implementing regulations including criminal, civil and administrative penalties, sanctions and regulatory controls of Schedule I substances will be imposed on the manufacture, distribution, possession, importation, and exportation of these synthetic cannabinoids.

**FOR FURTHER INFORMATION CONTACT:** Christine A. Sannerud, PhD, Chief, Drug and Chemical Evaluation Section, Office of Diversion Control, Drug Enforcement Administration, 8701 Morrisette Drive, Springfield, VA 22152, telephone (202) 307-7183, fax (202) 353-1263, or e-mail [ode@usdoj.gov](mailto:ode@usdoj.gov).

**DATES:** Effective Date: March 1, 2011.

**SUPPLEMENTARY INFORMATION:**

**Background**

The Comprehensive Crime Control Act of 1984 (Pub. L. 98-473), which was signed into law on October 12, 1984, amended section 201 of the CSA (**21 U.S.C. 811**) to give the Attorney General the authority to temporarily place a substance into Schedule I of the CSA for one year without regard to the requirements of 21 U.S.C. 811(b) if he finds that such action is necessary to avoid imminent hazard to the public safety. The Attorney General may extend the temporary scheduling up to six months during pendency of proceedings under 21 U.S.C. 811(a)(1). A substance may be temporarily scheduled under the emergency provisions of the CSA if it is not listed in any other schedule under section 202 of the CSA (**21 U.S.C. 812**) or if there is no exemption or approval in effect under 21 U.S.C. 355 for the substance. The Attorney General has delegated his authority under 21 U.S.C. 811 to the DEA Administrator (28 CFR 0.100).

As per section 201(h)(4) of the CSA (**21 U.S.C. 811(h)(4)**), the Deputy Administrator, now Administrator, transmitted notice of her intention to temporarily place JWH-018, JWH-073, JWH-200, CP-47,497, and cannabicyclohexanol into Schedule I of the CSA to the Assistant Secretary for Health of the Department of Health and Human Services (HHS) in a letter dated October 6, 2010. In response to this notification, the Assistant Secretary of Health, HHS communicated in a letter dated November 22, 2010, to the then-DEA Acting Administrator that there are no exemptions or approvals in effect for JWH-018, JWH-073, JWH-200, CP-47,497, and cannabicyclohexanol under Section 505 of the Federal Food, Drug and Cosmetic Act (21 U.S.C. 355). The substances are not listed in any other schedule in **21 U.S.C. 812**.

A notice of intent to temporarily place JWH-018, JWH-073, JWH-200, CP-47,497, and cannabicyclohexanol into Schedule I of the CSA was published in the Federal Register on November 24, 2010 (75 FR 71635). Before making a finding that temporarily placing a substance into Schedule I of the CSA is necessary to avoid an imminent hazard to the public safety, the Administrator must consider three of the eight factors (factors 4, 5, and 6) set forth in section 201(c) of the CSA (**21 U.S.C. 811(c)**). These factors are the history and current pattern of abuse, the scope, duration, and significance of abuse, and what, if any, risk there is to the public health, including actual abuse, diversion from legitimate channels, and clandestine importation, manufacture, or distribution. 21 U.S.C. 811(h)(3).

The temporary placement of these five synthetic cannabinoids into Schedule I of the CSA is necessary in order to avoid an imminent hazard to the public safety. First, these substances are not intended for human consumption, but there has been a rapid and significant increase in abuse of these substances in the United States. As a result of this abuse, synthetic cannabinoids are banned in at least 18 states in the United States and several countries, and all five branches of the U.S. military prohibit military personnel from possessing or using synthetic cannabinoids. Second, law enforcement has seized synthetic cannabinoids in conjunction with controlled substances and based on self-reports to law enforcement and health care professionals, synthetic cannabinoids are abused for their psychoactive properties. Third, numerous state and local public health departments and poison control centers have issued health warnings describing the adverse health effects associated with synthetic cannabinoids. Based on scientific data currently available, these five substances have the potential to be extremely harmful and, therefore, pose an imminent hazard to the public safety.



### **History and Current Pattern of Abuse**

A "cannabinoid" is a class of chemical compounds in the marijuana plant that are structurally related. The cannabinoid [Delta]9- tetrahydrocannabinol (THC) is the primary psychoactive constituent of marijuana. "Synthetic cannabinoids" are a large family of chemically unrelated structures functionally (biologically) similar to THC, the active principle of marijuana.

Two of the five synthetic cannabinoids (CP-47,497 and cannabicyclohexanol) were synthesized in the early 1980s for research purposes in the investigation of the cannabinoid system. JWH-018, JWH-073, and JWH-200 were prepared in the mid-1990s and evaluated to further advance understanding of drug-receptor interactions regarding the cannabinoid system. Developed and evaluated as research tools, no other known legitimate uses have been identified for these five synthetic cannabinoids. Furthermore, these five synthetic cannabinoids are not intended for human consumption.

The emergence of these five synthetic cannabinoids represents a recent phenomenon in the U.S. designer drug market. Since the initial identification of JWH-018 by U.S. forensic laboratories, many additional synthetic cannabinoids including JWH-073, JWH-200, CP- 47,497, and cannabicyclohexanol have been identified in related herbal incense products and plant food. These synthetic cannabinoids have purported psychotropic effects when smoked or ingested. These substances are typically found in powder form or are dissolved in appropriate solvents, such as acetone, before being sprayed on the plant material contained in the herbal incense products.

The popularity of these THC-like synthetic cannabinoids has significantly increased throughout the United States, and they are being abused for their psychoactive properties as reported by law enforcement, the medical community, and through scientific literature.

Some of the product names include, but are not limited to, "Spice," "K2," and many more. Due to sophisticated marketing, the products that contain these five THC-like synthetic cannabinoids are perceived as "legal" alternatives to marijuana despite the fact that they are typically advertised as herbal incense or plant food (Bonsai - 18) by Internet retailers, tobacco shops, head shops, and other domestic brick and mortar retail venues, and labeled "Not For Human Consumption." No evidence exists that these synthetic cannabinoids have value as an additive to herbal incense products due to the absence of odor associated with the substances.

Based on law enforcement encounters, these five substances are typically found laced on plant material. The plant material is packaged in small pouches or packets, and is being sold over the Internet, in tobacco and smoke shops, drug paraphernalia shops, gas stations, and convenience stores as herbal incense products, giving customers of all ages direct access to these five substances. Research articles propose that the packaging is professional and conspicuous, targeting young people, possibly eager to use cannabis, but who are afraid of the judicial consequences and/or association with illicit drugs.

According to Internet discussion boards and law enforcement encounters reported directly to DEA, these five synthetic cannabinoids are being both abused alone and/or being sprayed on plant material (which is then smoked). The most common route of administration of these synthetic cannabinoids is by smoking (using a pipe, a water pipe, or rolling the drug-spiked plant material in cigarette papers).

These five synthetic cannabinoids alone or spiked on plant material have the potential to be extremely harmful due to their method of manufacture and high pharmacological potency. There is little information regarding the pharmacology, toxicology, and safety of these substances in humans given the minimal amount of pre-clinical investigations undertaken regarding these substances; therefore, the full danger of these drugs has not yet been determined.

As of January 31, 2011, 18 states in the United States and other countries have controlled one or more of the five synthetic cannabinoids. Moreover, all five branches of the military prohibit their personnel from possessing or using synthetic cannabinoids associated with products such as Spice and K2.

### **Scope, Duration, and Significance of Abuse**

According to forensic laboratory reports, the initial appearance of these synthetic cannabinoids in herbal incense products in the United States occurred in November 2008 when U.S. Customs and Border Protection first encountered products such as Spice.

The increasing abuse of the five synthetic cannabinoids is demonstrated by the increase in federal, state, and local law enforcement activity associated with these substances. The National Forensic Laboratory Information System, a national repository for drug evidence analyses from forensic laboratories across the United States, has reported in excess of 500 exhibits containing synthetic cannabinoid from January 2010 through September 2010. These exhibits came from numerous states across the nation including Alabama, Arkansas, California, Florida, Hawaii, Iowa, Indiana, Kansas, Kentucky, Louisiana, Minnesota, Missouri, North Dakota, Nebraska, Nevada, Oklahoma, Pennsylvania, South Carolina, Tennessee, and Virginia.

Even though there is no evidence of legitimate non-research related use for these synthetic cannabinoids, multiple shipments of JWH-018 and JWH-073 have been encountered by U.S. Customs and Border Protection in 2010. One enforcement operation encountered five shipments of JWH-018 totaling over 50 kilograms (110.2 pounds) of powder. In addition, bulk loads of JWH-018 and JWH-200 have been encountered by law enforcement in 2010. For example, in Casper, Wyoming, DEA agents encountered large quantities of herbal incense products laced with the synthetic cannabinoid JWH-018 in conjunction with methamphetamine and other illegal drugs in execution of search and arrest warrants.

On March 24, 2010, the American Association of Poison Control Centers reported receiving 112 calls from 15 states related to synthetic cannabinoids to U.S. poison centers since 2009. Just nine months later, the number of calls increased to over 2,700 from 49 states and the District of Columbia.

#### **What, If Any, Risk There Is to the Public Health**

Health warnings have been issued by numerous state and local public health departments and poison control centers describing the adverse health effects associated with these synthetic cannabinoids and their related products, including agitation, anxiety, nausea, vomiting, tachycardia (fast, racing heartbeat), elevated blood pressure, tremor, seizures, hallucinations, paranoid behavior, and non-responsiveness.

Smoking these synthetic cannabinoids for the purpose of achieving intoxication and experiencing the psychoactive effects has been identified as a reason for emergency room visits and calls to poison control centers. In a fact sheet by the National Drug Court Institute, the problem of synthetic cannabinoid abuse is described as "significant and disturbing." This is supported by information that was communicated to DEA from one of the major private toxicology laboratories. Based on laboratory findings from drug screens for the period of July 2010 through November 2010, over 3,700 specimens tested positive for either JWH-018 or JWH-073. They also indicated that they were finding 30-35% positivity for specimens submitted by juvenile probation departments.

Case reports describe psychotic episodes, withdrawal, and dependence associated with use of these synthetic cannabinoids, similar to syndromes observed in marijuana abuse. In addition, based on law enforcement encounters reported directly to DEA, when responding to incidents involving individuals who have reportedly smoked these synthetic cannabinoids, first responders report that these individuals have suffered from intense hallucinations. Moreover, emergency department physicians and toxicologists have reported the adverse health effects associated with smoking herbal incense products laced with these substances. Furthermore, based on law enforcement encounters, suspected Driving Under the Influence of Drug incidents are attributed to the smoking of synthetic cannabinoids. For example, in September 2010, police in Nebraska responded to an incident involving a teenage male who had careened his truck into the side of a residence. After striking the residence and several more items, the teen continued several more yards before coming to a complete stop. Prior to crashing the truck, the individual had driven past a junior high school and nearly struck a child. Upon further investigation, the driver of the vehicle admitted to smoking "Wicked X," a product marketed as "herbal incense" and known to contain synthetic cannabinoids, prior to the accident. Preliminary toxicology reports indicated that the individual did not have any alcohol or other illegal substances in his system.

Detailed chemical analyses by DEA and other investigators have found these synthetic cannabinoids spiked on plant material in herbal incense products marketed to the general public. Product analyses have found variations in both the synthetic cannabinoid found on the plant material and the amount. As proposed in scientific literature, the risk of adverse health effects is further increased by the fact that similar products vary in the composition and concentration of synthetic cannabinoids spiked on the plant material.

Self-reported abuse of these THC-like synthetic cannabinoids either alone (e.g., in pills with the substance in powder form) or spiked on plant material appear extensively on Internet discussion boards, and abuse has been

reported to public health officials and law enforcement. The abuse of these substances spiked on plant material is corroborated by forensic laboratory analysis of products encountered by law enforcement.

According to the U.S. Customs and Border Protection, a number of the products and synthetic cannabinoids appear to originate from foreign sources. Product manufacturing operations encountered by law enforcement corroborate that the herbal incense products are manufactured in the absence of quality controls and devoid of regulatory oversight. Law enforcement has encountered the manufacture of herbal incense products occurring in such places as residential neighborhoods. These products and associated synthetic cannabinoids are readily accessible via the Internet.

Based on the above data, the continued uncontrolled manufacture, distribution, importation, exportation, and possession of JWH-018, JWH-073, JWH-200, CP-47,497, and cannabicyclohexanol pose an imminent hazard to the public safety. DEA is not aware of any recognized therapeutic uses of these synthetic cannabinoids in the United States.

DEA has considered the three criteria for placing a substance into Schedule I of the CSA (**21 U.S.C. 812**). The data available and reviewed for JWH-073, JWH-018, JWH-200, CP-47,497, and cannabicyclohexanol indicate that these synthetic cannabinoids each has a high potential for abuse, no currently accepted medical use in treatment in the United States and a lack of accepted safety for use under medical supervision.

In accordance with the provisions of section 201(h) of the CSA (**21 U.S.C. 811(h)**) and 28 CFR 0.100, the Administrator has considered the available data and the three factors required to support a determination to temporarily schedule five synthetic cannabinoids: 1- butyl-3-(1-naphthoyl)indole, 1-pentyl-3-(1-naphthoyl)indole, 1-[2-(4-morpholinyl)ethyl]-3-(1-naphthoyl)indole, 5-(1,1-dimethylheptyl)-2- [(1R,3S)-3-hydroxycyclohexyl]-phenol, and 5-(1,1-dimethyloctyl)-2- [(1R,3S)-3-hydroxycyclohexyl]-phenol in Schedule I of the CSA and finds that temporary placement of these synthetic cannabinoids into Schedule I of the CSA is necessary to avoid an imminent hazard to the public safety.

### **Regulatory Requirements**

With the issuance of this final order, JWH-018, JWH-073, JWH-200, CP-47,497, and cannabicyclohexanol become subject to the regulatory controls and administrative, civil and criminal sanctions applicable to the manufacture, distribution, possession, importation, and exportation of a Schedule I controlled substance under the CSA.

1. Registration. Any person who manufactures, distributes, dispenses, imports, exports, or possesses JWH-018, JWH-073, JWH-200, CP-47,497, or cannabicyclohexanol or who engages in research or conducts instructional activities with respect to JWH-018, JWH-073, JWH-200, CP-47,497, or cannabicyclohexanol, or who proposes to engage in such activities, must be registered to conduct such activities in accordance with **21 U.S.C. 823** and **958**. Any person who is currently engaged in any of the above activities and is not registered with DEA must submit an application for registration and may not continue their activities until DEA has approved that application. Retail sales of Schedule I controlled substances to the general public are not allowed under the Controlled Substances Act.
2. Security. JWH-018, JWH-073, JWH-200, CP-47,497, and cannabicyclohexanol are subject to Schedule I security requirements. Accordingly, appropriately registered DEA registrants must manufacture, distribute and store these substances in accordance with **1301.71**; **1301.72(a)**, (c), and (d); **1301.73**; **1301.74**; **1301.75(a)** and (c); and **1301.76** of Title 21 of the Code of Federal Regulations as of March 1, 2011.
3. Labeling and packaging. All labeling and packaging requirements for controlled substances set forth in **Part 1302** of Title 21 of the Code of Federal Regulations shall apply to commercial containers of JWH-018, JWH-073, JWH-200, CP-47,497, and cannabicyclohexanol. Current DEA registrants shall have thirty (30) calendar days from the effective date of this Final Order to be in compliance with all labeling and packaging requirements.
4. Quotas. Quotas for JWH-018, JWH-073, JWH-200, CP-47,497, and cannabicyclohexanol will be established based on registrations granted and quota applications received pursuant to **part 1303** of Title 21 of the Code of Federal Regulations.

5. Inventory. Every DEA registrant who possesses any quantity of JWH-018, JWH-073, JWH-200, CP-47,497, or cannabicyclohexanol is required to keep inventory of all stocks of these substances on hand pursuant to **1304.03**, **1304.04**, and **1304.11** of Title 21 of the Code of Federal Regulations. Every current DEA registrant who desires registration in Schedule I for JWH-018, JWH-073, JWH-200, CP-47,497, or cannabicyclohexanol shall conduct an inventory of all stocks of these substances. Current DEA registrants shall have thirty (30) calendar days from the effective date of this Final Order to be in compliance with all inventory requirements.
6. Records. All registrants who handle JWH-018, JWH-073, JWH-200, CP-47,497, or cannabicyclohexanol are required to keep records pursuant to **1304.03**, **1304.04**, **1304.21**, **1304.22**, and **1304.23** of Title 21 of the Code of Federal Regulations. Current DEA registrants shall have thirty (30) calendar days from the effective date of this Final Order to be in compliance with all recordkeeping requirements.
7. Reports. All registrants are required to submit reports in accordance with **1304.33** of Title 21 of the Code of Federal Regulations. Registrants who manufacture or distribute JWH-018, JWH-073, JWH-200, CP-47,497, or cannabicyclohexanol are required to comply with these reporting requirements and shall do so as of March 1, 2011.
8. Order Forms. All registrants involved in the distribution of JWH-018, JWH-073, JWH-200, CP-47,497, or cannabicyclohexanol must comply with order form requirements of **part 1305** of Title 21 of the Code of Federal Regulations as of March 1, 2011.
9. Importation and Exportation. All importation and exportation of JWH-018, JWH-073, JWH-200, CP-47,497, or cannabicyclohexanol must be conducted by appropriately registered DEA registrants in compliance with **part 1312** of Title 21 of the Code of Federal Regulations on or after March 1, 2011.
10. Criminal Liability. The manufacture, distribution, dispensation, or possession with the intent to conduct these activities; possession; importation; or exportation of JWH-018, JWH-073, JWH-200, CP-47,497, or cannabicyclohexanol not authorized by, or in violation of the CSA or the Controlled Substances Import and Export Act occurring as of March 1, 2011 is unlawful.

[Editor's Note: See the Federal Register for information regarding the Regulatory Requirements involving Executive Order 12988, Executive Order 13132, the Congressional Review Act, and the Unfunded Mandates Reform Act of 1995.]

### List of Subjects in 21 CFR Part 1308

Administrative practice and procedure, Drug traffic control, Reporting and recordkeeping requirements.

Under the authority vested in the Attorney General by section 201(h) of the CSA (**21 U.S.C. 811(h)**), the Administrator hereby amends 21 CFR part 1308 as follows:

### PART 1308--SCHEDULES OF CONTROLLED SUBSTANCES

1. The authority citation for part 1308 continues to read as follows:  
Authority: **21 U.S.C. 811, 812, 871(b)**, unless otherwise noted.
2. **Section 1308.11** is amended by adding new paragraphs (g)(1), (2), (3), (4), and (5) to read as follows:

#### Sec. 1308.11 Schedule I.

\* \* \* \* \*

(g) \* \* \*

- (1) 5-(1,1-Dimethylheptyl)-2-[(1R,3S)-3-hydroxycyclohexyl]-phenol, its optical, positional, and geometric isomers, salts and salts of isomers--7297 (Other names: CP-47,497)
- (2) 5-(1,1-Dimethyloctyl)-2-[(1R,3S)-3-hydroxycyclohexyl]-phenol, its optical, positional, and geometric isomers, salts and salts of isomers--7298 (Other names: cannabicyclohexanol and CP-47,497 C8 homologue)

- (3) 1-Butyl-3-(1-naphthoyl)indole, its optical, positional, and geometric isomers, salts and salts of isomers--7173 (Other names: JWH- 073)
- (4) 1-[2-(4-Morpholinyl)ethyl]-3-(1-naphthoyl)indole, its optical, positional, and geometric isomers, salts and salts of isomers--7200 (Other names: JWH-200)
- (5) 1-Pentyl-3-(1-naphthoyl)indole, its optical, positional, and geometric isomers, salts and salts of isomers--7118 (Other names: JWH- 018 and AM678)

Dated: February 18, 2011.

**Michele M. Leonhart,**  
Administrator.

[FR Doc. 2011-4428 Filed 2-28-11; 8:45 am]  
BILLING CODE 4410-09-P

\* \* \* \* \*

## SELECTED REFERENCES

[The Selected References section is a compilation of recent publications of presumed interest to forensic chemists. Unless otherwise stated, all listed citations are published in English. Abbreviated mailing address information duplicates that which is provided by the abstracting service. Patents and Proceedings are reported only by their *Chemical Abstracts* citation number. For full text copies of any of the articles listed, you may email the DEA Library at dea.library -at- usdoj.gov]

1. Dresen S, Ferreiros N, Puetz M, Westphal F, Zimmermann R, Auwaerter V. **Monitoring of herbal mixtures potentially containing synthetic cannabinoids as psychoactive compounds.** *Journal of Mass Spectrometry* 2010;45(10):1186-1194. [Editor's Notes: The results of the monitoring of commercially available "incense" products from June 2008 to September 2009 are presented. In this period of time, more than 140 samples of herbal mixtures were analyzed for bioactive ingredients and synthetic cannabimimetic substances in particular. The results show that the composition of many products changed repeatedly over time as a reaction to prohibition and prosecution. Therefore neither the reseller nor the consumer of these mixtures can predict the actual content of the "incense" products. As long as there is no possibility of generic definitions in the controlled substances legislation, new designer cannabinoids will appear on the market as soon as the next legal step has been taken. This has been affirmed by the recent identification of the aminoalkylindoles JWH-250 and JWH-398. The identification of the synthetic opioid O-desmethyldiamorphine in a herbal mixture declared to contain "kratom" proves that the concept of selling apparently natural products spiked with potentially dangerous synthetic chemicals/pharmaceuticals is a continuing trend for the market of "legal highs." Contact: Institute of Forensic Medicine, Forensic Toxicology, University Medical Center Freiburg, Freiburg D-79104, Germany.]
2. Guan F, Uboh CE, Soma LR, You Y, Liu Y, Li X. **Correlation of product ion profiles with molecular structures of androgenic and anabolic steroids in ESI MS/MS.** *Journal of Mass Spectrometry* 2010;45(11):1261-1269. [Editor's Notes: Presents title study. Contact: School of Veterinary Medicine, University of Pennsylvania, Kennett Square, PA 19348, USA.]

### Additional References of Possible Interest:

1. Soederholm SL, Damm M, Kappe CO. **Microwave-assisted derivatization procedures for gas chromatography/mass spectrometry analysis.** *Molecular Diversity* 2010;14(4):869-888. [Editor's Notes: In this review, published applications of microwave-assisted derivatization procedures for GC/MS are summarized. Despite the many advantages of GC/MS, time-consuming derivatization steps are often required in order to obtain desirable chromatographic characteristics or to improve the stability and detectability of the target analytes. These derivatization processes typically require reaction times from 30 minutes up to several hours at elevated temperatures. In contrast, microwave protocols have been shown to reduce the time required for derivatization to a few minutes, and can thus very effectively shorten the overall analysis time, in particular when carried out in a high-throughput format. Herein, the literature in this field is summarized and recent experimental techniques for performing parallel GC/MS derivatization protocols are discussed. Contact: Christian Doppler Laboratory for Microwave Chemistry (CDLMC), Institute of Chemistry, Karl-Franzens-University Graz, Graz 8010, Austria.]
2. Singh N, Day P, Katta VR, Mohammed GP, Lough WJ. **LC purity and related substances screening for mephedrone.** *Journal of Pharmacy and Pharmacology* 2010;62(10):1209-1210. [Editor's Notes: Presents title study. Contact: Department of Pharmacy, Health and Well-Being, University of Sunderland, Sunderland, UK.]

\* \* \* \* \*

## THE JOURNAL/TEXTBOOK COLLECTION EXCHANGE

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*Forensic Science International* (Microfilm) 1983; Vol. 21 to 1996; Vol. 83  
*Journal of Chromatography* (Microfilm) 1958; Vol. 1 to 1993; Vol. 622  
*Journal of Chromatography A* (Microfilm) 1993; Vol. 652 to 2001; Vol. 921  
*Journal of Chromatography B* (Microfilm) 1994; Vol. 652 to 2004; Vol. 813  
*Journal of Forensic Sciences* (Microfilm) 1956; Vol. 1 to 1977; Vol. 22  
*Journal of Forensic Sciences* (Microfilm) 1985; Vol. 30 to 1996; Vol. 41  
*Journal of Pharmacy and Pharmacology* (Microfilm) 1965; Vol. 17 to 1987; Vol. 39  
*Science* (Microfilm) 1998; Vol. 279 to 2004; Vol. 306

All subscribers are encouraged to donate surplus or unwanted items/collections. Reference texts and long runs of forensic/analytical journals are of particular interest; however, even single issues are worthwhile, and may fill a hole in an existing collection. If interested, please consult the *Microgram* website or contact the *Microgram* Editor for further instructions.



## THE DEA FY 2011 STATE AND LOCAL FORENSIC CHEMISTS SEMINAR SCHEDULE

The FY 2011 schedule for the State and Local Forensic Chemists Seminar is as follows:

June 6-10, 2011  
September 12-16, 2011

The school is open only to forensic chemists working for law enforcement agencies. It is intended for chemists who have completed their agency's internal training program and have also been working on the bench for at least one year. There is no tuition charge. The course is held at the Hyatt Place Dulles North Hotel in Sterling, Virginia (near the Washington/Dulles International Airport). A copy of the application form is reproduced on the last page of this issue of *Microgram Bulletin*. Completed applications should be mailed to the Special Testing and Research Laboratory (Attention: J. Head) at 22624 Dulles Summit Court, Dulles, VA 20166. For additional information, call (703) 668-3349.

\* \* \* \* \*

### SCIENTIFIC MEETINGS

**Title:** 2011 Mid-Atlantic Association of Forensic Scientists Annual Meeting

**Sponsoring Organization:** Mid-Atlantic Association of Forensic Scientists

**Inclusive Dates:** May 23-27, 2011

**Location:** Founder's Inn and Spa (Virginia Beach, VA)

**Contact Information:** [maafsmtg@gmail.com](mailto:maafsmtg@gmail.com)

**Website:** [www.maafs.org](http://www.maafs.org)

\* \* \* \* \*

<b>DEA State and Local Forensic Chemist Seminar Application</b>			
Name: (PRINT NAME EXACTLY AS IT IS TO APPEAR ON CERTIFICATE)		Title:	
Employer:			
Your Office Mailing Address (include city, state, and zip code):			Length of Service:
Business Telephone: (     )     -	Business Fax: (     )     -	Date of Application:	
Email Address:			
Education			
College or University	Degree	Major	
Please Check Which Techniques or Equipment Are Used in Your Laboratory			
<input type="checkbox"/>	Color Tests	<input type="checkbox"/>	UV
<input type="checkbox"/>	Column Chromatography	<input type="checkbox"/>	IR
<input type="checkbox"/>	Microcrystal Tests	<input type="checkbox"/>	CE
<input type="checkbox"/>	Thin Layer Chromatography	<input type="checkbox"/>	GC/MS
<input type="checkbox"/>	GC	<input type="checkbox"/>	Other (please specify)
<input type="checkbox"/>	HPLC	<input type="checkbox"/>	Other (please specify)
Indicate Analytical Problem(s) Nominee Would Like to Have Covered:			
Choice of Seminar Dates:			
1st Choice:		2nd Choice:	
Laboratory Chief/Director:			
Printed Name: _____		Signature: _____	
Title: _____		Date: _____	
Phone: _____			



# Microgram

## *Bulletin*

Published by:

The Drug Enforcement Administration  
Office of Forensic Sciences  
Washington, DC 20537

The U.S. Attorney General has determined that the publication of this periodical is necessary in the transaction of the public business required by the Department of Justice. Information, instruction, and disclaimers are published in the January issues.

- APRIL 2011 -

### REQUEST FOR INFORMATION ON SYNTHETIC CATHINONES

The sudden appearance of synthetic cathinones (see list below) on the designer drug market in the United States is of great concern.

- **MDPV** *synonym* 3,4-methylenedioxypropylvalerone
- **Mephedrone** *synonyms* 4-methylmethcathinone, 4-MMC
- **Methylone** *synonyms* 3,4-methylenedioxymethcathinone, MDMC
- **Naphyrone** *synonyms* naphthylpyrovalerone, NRG-1
- **4-Fluoromethcathinone** *synonyms* 4-FMC, flephedrone
- **3-Fluoromethcathinone** *synonym* 3-FMC
- **Methedrone** *synonyms* 4-methoxymethcathinone, bk-PMMA, PMMC
- **Butylone** *synonyms* bk-MBDB, beta-keto-N-methylbenzodioxolylpropylamine

Although these substances are new to the United States drug market, they have been popular in Europe since 2007. These substances are falsely marketed as “research chemicals,” “plant food,” or “bath salts.” They are sold at smoke shops, head shops, convenience stores, adult book stores, and gas stations and can also be purchased on the Internet. These substances are manufactured in the form of capsules, tablets, and powders. The packages of these commercial products usually contain the warning “not for human consumption” most likely in an effort to circumvent statutory restrictions for these substances. Some of the products found to contain synthetic cathinones include, but are not limited to: Ivory Wave, Vanilla Sky, Energy 1, Explosion, Meow Meow, Bubbles, and others.

Evidence from law enforcement and poison control centers indicates that the use of these substances appears to be widespread and is growing. The American Association of Poison Control Centers reported that in 2010, poison centers took 298 calls about synthetic cathinones.

As of March 2011, poison control centers have received 1,241 calls relating to these products for this year. These calls were received in poison centers in 47 states and in the District of Columbia. In 2009, the National Forensic Information System (NFLIS) received 14 reports of analyzed seizures from 8 states related to these substances. However, in 2010, there were 290 reports of analyzed seizures from 21 states related to these substances reported to NFLIS. Thirteen states including Alabama, Florida, Hawaii, Idaho, Kentucky, Louisiana, Michigan, Mississippi, North Carolina, North Dakota, Utah, Virginia, and Wyoming have passed laws to control all or many of these synthetic cathinones.

MDPV and mephedrone are psychoactive chemicals that are structurally related to the schedule I stimulants, cathinone, with a ring-bearing substituent group, and methcathinone, respectively. Cathinone derivatives including those which bear ring-group substituents have been reported to induce subjective effects similar to those induced by cocaine, amphetamine, 3,4-methylene-dioxymethamphetamine (MDMA), and methcathinone. MDPV and mephedrone are not scheduled under the Controlled Substances Act (CSA). However, law enforcement cases involving synthetic cathinones can be prosecuted under the Controlled Substances Analogue Enforcement Act if the synthetic cathinone meets the definition of a “controlled substance analogue.”

Methylone is psychoactive chemical that is structurally and pharmacologically similar to the schedule I substance MDMA. Methylone is not scheduled under the CSA. Naphyrone, 4-fluoromethcathinone, 3-fluoromethcathinone, methedrone, and butylone are not scheduled under the CSA, but they have been identified by U. S. Drug Courts in drug screens or in the International drug market.

These substances are popular with the youth in urban environments, with males appearing to use synthetic cathinones more than females. The most common routes of administration are inhalation by snorting the powder and ingestion by taking capsules or tablets. The powder can also be injected or swallowed. Abusers report effects occurring a few minutes to 15 minutes after administration, depending on the route of administration, and the effects can last up to 3 hours

The Drug and Chemical Evaluation Section (ODE) of the DEA Office of Diversion Control continues to gather information on the pharmacology, toxicity, and abuse of synthetic cathinones and products containing these substances to support possible scheduling of these substances. ODE would greatly appreciate any information related to law enforcement encounters, drug identification, toxicology reports, medical examiner reports, and abuse related to these synthetic cathinones. This includes, but is not limited to, any information associated with the biological response occurring from episodes, data describing toxic effects from exposure to these substances occurring in humans or animals, toxicology reports, risk assessments, identification of these substances to establish prevalence and trends, and suspicion of poisonings connected to patients or postmortem samples. Information that connects these substances to adverse health effects is of particular interest and would provide valuable assistance in the evaluation of these substances for a federal control action.

**Contact Us:**

DEA Headquarters  
ATTN: Drug and Chemical Evaluation Section (ODE)  
8701 Morrisette Drive  
Springfield, VA 22152  
Phone: (202) 307-7183  
Fax: (202) 353-1263  
E-mail: [ODE@usdoj.gov](mailto:ODE@usdoj.gov)

## SELECTED REFERENCES

[The Selected References section is a compilation of recent publications of presumed interest to forensic chemists. Unless otherwise stated, all listed citations are published in English. Abbreviated mailing address information duplicates that which is provided by the abstracting service. Patents and Proceedings are reported only by their *Chemical Abstracts* citation number.]

1. Becue I, Van Poucke C, Van Peteghem C. **An LC-MS screening method with library identification for the detection of steroids in dietary supplements.** *Journal of Mass Spectrometry* 2011;46(3):327-335. [Editor's Notes: A new mass spectral library of 88 steroids was developed for LC/MS, along with a fast UPLC/MS method. For the construction of this mass spectral library, three different mass spectra were measured for each steroid, with a sample cone voltage of 30, 60 and 100 V, respectively. This method was then successfully tested on contaminated dietary supplements which had previously been tested by means of a targeted LC-MS/MS method. Overall, the library search was shown to identify the same compounds as the MRM method. Contact: Laboratory of Food Analysis, Ghent University, Ghent 9000, Belgium.]
2. Debrus B, Broseus J, Guillarme D, Lebrun P, Hubert P, Veuthey JL, Esseiva P, Rudaz S. **Innovative methodology to transfer conventional GC-MS heroin profiling to UHPLC-MS/MS.** *Analytical and Bioanalytical Chemistry* 2010;399(8):2583-2746. [Editor's Notes: Presents title study. Contact: Laboratory of Analytical Chemistry, Department of Pharmacy, CIRM, University of Liege, Liege 4000, Belgium.]
3. Frison G, Gregio M, Zamengo L, Zancanaro F, Frasson S, Sciarrone R. **Gas chromatography/mass spectrometry determination of mephedrone in drug seizures after derivatization with 2,2,2-trichloroethyl chloroformate.** *Rapid Communications in Mass Spectrometry* 2011;25(2):387-390. [Editor's Notes: Presents title study. Contact: Department of Prevention, Laboratory of Environmental Hygiene and Forensic Toxicology, Azienda ULSS 12 Veneziana, I-30174 Mestre, Veneziana, Italy.]
4. Verkouteren JR, Staymates JL. **Reliability of ion mobility spectrometry for qualitative analysis of complex, multicomponent illicit drug samples.** *Forensic Science International* 2011;206(1-3):190-196. [Editor's Notes: Ion mobility spectrometry (IMS) has been used for trace analysis of illicit drugs, but it can also provide reliable qualitative analysis of bulk forensic drug items, despite the complexity of these samples. The drug/drug and drug/excipient combinations used in this study represent over 80% of the samples reported in NFLIS. From this set of materials, IMS detection windows were set for eight controlled substances, including methamphetamine, MDMA, cocaine, heroin, fentanyl, hydrocodone, oxycodone, and alprazolam. The reduced mobilities of the eight controlled substances were measured over an extended period of time to determine variability with respect to the size of the detection windows. Uncertainties in reduced mobilities smaller than  $0.001 \text{ cm}^2 \text{ V}^{-1} \text{ s}^{-1}$  were obtained, and detection windows were set to between  $\pm 0.003$  and  $\pm 0.005 \text{ cm}^2 \text{ V}^{-1} \text{ s}^{-1}$ . Reduced mobilities are instrument and operating condition dependent, and must be determined for each instrument. Peak overlaps are observed in the drug/drug combinations, but at least one controlled substance can be detected in each mixture. Excipient concentrations must be quite high ( $>75 \text{ wt}\%$ ) in binary

mixtures to interfere with the detection of the controlled substance. IMS can be used to identify many of the excipients, and can detect multiple (for these samples, as many as four) substances in complex samples. Over-the-counter (OTC) tablet medications for cold, flu, and allergy relief can be distinguished from tablets containing controlled substances. Bulk materials, including tablets, are sampled simply by using a fine probe to restrict the amount of material transferred to the IMS substrate. IMS represents a distinct advantage over color tests for field analysis of illicit drugs, except in the case of cannabis/THC samples. Contact: Surface and Microanalysis Division, National Institute of Standards and Technology, Gaithersburg, MD 20899, USA.]

#### **Additional References of Possible Interest:**

1. Dresen S, Kneisel S, Weinmann W, Zimmermann R, Auwaerter V. **Development and validation of a liquid chromatography-tandem mass spectrometry method for the quantitation of synthetic cannabinoids of the aminoalkylindole type and methanandamide in serum and its application to forensic samples.** Journal of Mass Spectrometry 2011;46(2):163-171. [Editor's Notes: Presents title study. Contact: Institute of Forensic Medicine, Forensic Toxicology, University Medical Center Freiburg, Freiburg, Germany.]
2. Jiang, G. **Use of UHPLC-MS to determine illicit drugs.** American Laboratory 2010;42(8):40-42. [Editor's Notes: Presents title study. Contact: LC/LC-MS Marketing Department, Thermo Fisher Scientific, San Jose, CA 95134 USA.]
3. Papp A, Csikai J. **Detection and identification of explosives and illicit drugs using neutron based techniques.** Journal of Radioanalytical and Nuclear Chemistry 2011;288(2):363-371. [Editor's Notes: Some methods developed by the Institute of Nuclear Research (ATOMKI) and the Institute of Experimental Physics (IEP) for bulk hydrogen analysis and for the detection and identification of illicit drugs are presented. Advantages and limitations of neutron techniques (reflection, transmission, elastic and inelastic scatterings, leakage spectra and angular yields of Be(d,n), Pu-Be, D-D, D-T and <sup>252</sup>Cf neutrons transmitted from thick samples, effects of hidden materials) are discussed. Contact: Institute of Nuclear Research (ATOMKI), Hungarian Academy of Sciences, Debrecen 4001, Hungary.]
4. Zaitseva K, Katagi M, Kamata H, Nakanishi K, Shima N, Kamata T, Nishioka H, Miki A, Tatsuno M, Tsuchihashi H. **Simultaneous analysis of six novel hallucinogenic (tetrahydrobenzodifuranyl)aminoalkanes (FLYs) and (benzodifuranyl)aminoalkanes (DragonFLYs) by GC-MS, LC-MS, and LC-MS-MS.** Forensic Toxicology 2010;28(1):9-18. [Editor's Notes: Presents title study. Contact: Forensic Science Laboratory, Osaka Prefectural Police HQ, 1-3-18 Hommachi, Chuo-ku, Osaka, Japan 541-0053.]

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June 6-10, 2011  
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## SCIENTIFIC MEETINGS

**Title:** 2011 Mid-Atlantic Association of Forensic Scientists Annual Meeting

**Sponsoring Organization:** Mid-Atlantic Association of Forensic Scientists

**Inclusive Dates:** May 23-27, 2011

**Location:** Founder's Inn and Spa (Virginia Beach, VA)

**Contact Information:** [maafsmtg@gmail.com](mailto:maafsmtg@gmail.com)

**Website:** [www.maafs.org](http://www.maafs.org)

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<b>DEA State and Local Forensic Chemist Seminar Application</b>			
Name: (PRINT NAME EXACTLY AS IT IS TO APPEAR ON CERTIFICATE)		Title:	
Employer:			
Your Office Mailing Address (include city, state, and zipcode):			Length of Service:
Business Telephone: (     )     -	Business Fax: (     )     -	Date of Application:	
Email Address:			
Education			
College or University	Degree	Major	
Please Check Which Techniques or Equipment Are Used in Your Laboratory			
<input type="checkbox"/>	Color Tests	<input type="checkbox"/>	UV
<input type="checkbox"/>	Column Chromatography	<input type="checkbox"/>	IR
<input type="checkbox"/>	Microcrystal Tests	<input type="checkbox"/>	CE
<input type="checkbox"/>	Thin Layer Chromatography	<input type="checkbox"/>	GC/MS
<input type="checkbox"/>	GC	<input type="checkbox"/>	Other (please specify)
<input type="checkbox"/>	HPLC	<input type="checkbox"/>	Other (please specify)
Indicate Analytical Problem(s) Nominee Would Like to Have Covered:			
Choice of Seminar Dates:			
1st Choice:		2nd Choice:	
Laboratory Chief/Director:			
Printed Name: _____		Signature: _____	
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1. Nakajima J, Takahashi M, Seto T, Suzuki J. **Identification and quantitation of cannabimimetic compound JWH-250 as an adulterant in products obtained via the Internet.** *Forensic Toxicology* 2011;29(1):51-55. [Editor's Notes: Presents title study. Contact: Division of Drugs, Tokyo Metropolitan Institute of Public Health 3-24-1 Hyakunin-cho, Shinjuku-ku, Tokyo 169-0073, Japan.]
2. Rana V, Canameres MV, Kubic T, Leona M, Lombardi JR. **Surface-enhanced Raman spectroscopy for trace identification of controlled substances: morphine, codeine, and hydrocodone.** *Journal of Forensic Sciences* 2011;56(1):200-207. [Editor's Notes: Presents title study. Contact: Department of Forensic Science, John Jay College of Criminal Justice, New York, NY 10019, USA.]
3. Uchiyama N, Kawamura M, Kikura-Hanajiri R, Goda Y. **Identification and quantitation of two cannabimimetic phenylacetylindoles JWH-251 and JWH-250, and four cannabimimetic naphthoylindoles JWH-081, JWH-015, JWH-200, and JWH-073 as designer drugs in illegal products.** *Forensic Toxicology* 2011; 29(1):25-37. [Editor's Notes: Presents title study. Contact: National Institute of Health Sciences 1-18-1 Kamiyoga, Setagaya-ku, Tokyo 158-8501, Japan.]

4. Westphal F, Junge T, Girreser U, Stobbe S, Perez SB. **Structure elucidation of a new designer benzylpiperazine: 4-Bromo-2,5-dimethoxybenzylpiperazine.** Forensic Science International 2009;187(1-3):87-96. [Editor's Notes: Presents title study. Contact: Landeskriminalamt Schleswig-Holstein, 24116 Kiel, Germany.]

#### Additional References of Possible Interest:

1. Muccio Z, Jackson GP. **Simultaneous identification and  $\delta^{13}\text{C}$  classification of drugs using GC with concurrent single quadrupole and isotope ratio mass spectrometers.** Journal of Forensic Sciences 2011;56(S1),S203-S209. [Editor's Notes: In this study,  $\delta^{13}\text{C}$  values of six cocaine samples were identified and classified using a single quadrupole mass spectrometer and an isotope ratio mass spectrometry (IRMS) as simultaneous gas chromatography detectors. Our instrument modification is simple to use and is useful (i) when the sample is of limited size or can only be injected once, (ii) to help identify peaks in a complicated IRMS chromatogram, and (iii) to help differentiate very simple systems when impurity profiling is not possible. The EI-MS confirmed the identity of cocaine in each sample. The IRMS data distinguished 12 of the 15 possible pair-wise comparisons at the 95% CL. Three samples could not be differentiated by their  $\delta^{13}\text{C}$  ratios for cocaine. ANOVA demonstrated that the measurement variance was consistently larger than the sample variance. As the  $\delta^{13}\text{C}$  values clearly show, this technique enables the exclusion of a potential common source even when two samples have otherwise identical chemical and physical properties. Contact: Center for Intelligent Chemical Instrumentation, Department of Chemistry and Biochemistry, Ohio University, Athens, OH 45701-2979, USA.]
2. Salter TL, Green FM, Gilmore IS, Seah MP, Stokes P. **A comparison of SIMS and DESI and their complementarities.** Surface and Interface Analysis 2011; 43(1-2):294-297. [Editor's Notes: Presents title study. Contacts: National Physical Laboratory (NPL), Teddington, Middlesex TW11 0LW, UK.]
3. Sardela VF, Sardela PDO, Pereira HMG, Aquino Neto FR. **Consequences of the formation of 3,4-dimethyl-5-phenyl-1,3-oxazolidine on the analysis of ephedrine in urine by gas chromatography and a new method for confirmation as N-trifluoroacetyl-O-t-butyl dimethylsilyl ether derivatives.** Journal of Chromatography, A 2011;1218(9):1266-1272. [Editor's Notes: The compound 3,4-dimethyl-5-phenyl-1,3-oxazolidine can appear as an artifact during the gas chromatographic analysis of ephedrine. Its presence is a risk for doping control and forensic analyses. An evaluation of its formation showed the possibility of a false positive for ephedrine, a false negative for pseudoephedrine, and increased uncertainty in the quantitative approach. The use of N-TFA-O-TBDMS derivatives prior to GC analysis gives improved chromatographic resolution, allowing for the separation of ephedrine. The differences in the mass spectra of the N-TFA-O-TBDMS derivatives are also more pronounced. Contact: Universidade Federal do Rio de Janeiro, Ilha do Fundao, Avenida Athos da Silveira Ramos, 149, LAB DOP-LADETEC, Instituto de Quimica, Rio de Janeiro, RJ 21941-909, Brazil.]

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## SCIENTIFIC MEETINGS

**Title:** 40<sup>th</sup> Annual Meeting of MAFS  
**Sponsoring Organization:** Midwestern Association of Forensic Scientists  
**Inclusive Dates:** September 19-23, 2011  
**Location:** Weston Hotel at Yorktown (Lombard, IL)  
**Contact Information:** See website  
**Website:** [www.mafs.net](http://www.mafs.net)



**Title:** 2011 Northwest Association of Forensic Scientists Meeting  
**Sponsoring Organization:** Northwest Association of Forensic Scientists  
**Inclusive Dates:** September 25-30, 2011  
**Location:** Hotel Murano (Tacoma, WA)  
**Contact Information:** See website  
**Website:** [www.nwafs.org](http://www.nwafs.org)

**Title:** Southwestern Association of Forensic Scientists Annual Conference  
**Sponsoring Organization:** Southwestern Association of Forensic Scientists  
**Inclusive Dates:** October 3-7, 2011  
**Location:** Houston Marriott at Texas Medical Center (Houston, TX)  
**Contact Information:** See website  
**Website:** [www.swafs.us](http://www.swafs.us)

**Title:** The 2011 Northeastern Association of Forensic Scientists Annual Meeting  
**Sponsoring Organization:** Northeastern Association of Forensic Scientists  
**Inclusive Dates:** November 1-5, 2011  
**Location:** Hyatt Regency Hotel & Spa (Newport, RI)  
**Contact Information:** See website  
**Website:** [www.neafs.org](http://www.neafs.org)

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Email Address:			
Education			
College or University	Degree	Major	
Please Check Which Techniques or Equipment Are Used in Your Laboratory			
<input type="checkbox"/>	Color Tests	<input type="checkbox"/>	UV
<input type="checkbox"/>	Column Chromatography	<input type="checkbox"/>	IR
<input type="checkbox"/>	Microcrystal Tests	<input type="checkbox"/>	CE
<input type="checkbox"/>	Thin Layer Chromatography	<input type="checkbox"/>	GC/MS
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1. Bozenko JS. **The Characterization of Anastrozole.** Microgram Journal 2011;8(1):12-15. [Editor's Notes: Presents title study. Contact: Drug Enforcement Administration, Special Testing and Research Laboratory, 22624 Dulles Summit Court, Dulles, VA 20166, USA.]
2. Casale JF, Hays PA. **Characterization of 2 $\beta$ -(1,2,4-Oxadiazol-5-methyl)-3 $\beta$ -phenyltropane ("RTI-126").** Microgram Journal 2011;8(1):3-11. [Editor's Notes: Spectroscopic and chromatographic data are provided for 2 $\beta$ -(1,2,4-oxadiazol-5-methyl)-3 $\beta$ -phenyltropane (commonly referred to as RTI-126), its 2 $\alpha$ -epimer, and their respective synthetic intermediates. Direct comparisons of the analytical data are made to assist forensic chemists in correctly differentiating these epimeric isomers in suspected drug exhibits. Contact: Drug Enforcement Administration, Special Testing and Research Laboratory, 22624 Dulles Summit Court, Dulles, VA 20166, USA.]

3. Esseiva P, Gaste L, Alvarez D, Anglada F. **Illicit drug profiling, reflection on statistical comparisons.** Forensic Science International 2011;207(1-3):27-34. [Editor's Notes: Presents title study. Contact: Institut de Police Scientifique, University of Lausanne, Batiment de Chimie, Lausanne-Dorigny CH-1015, Switzerland.]
4. Zuba D, Byrska B, Maciow M. **Comparison of "herbal highs" composition.** Analytical and Bioanalytical Chemistry 2011;400(1):119-126. [Editor's Notes: Presents title study. Contact: Institute of Forensic Toxicology, Krakow 31033, Poland.]

#### **Additional References of Possible Interest:**

1. Lanza A, Gratz S, Brueggemeyer T, Witkowski M. **A targeted approach to detect controlled substances in suspect tablets using attenuated total internal reflection Fourier-transform infrared spectroscopic imaging.** Spectroscopy 2011;26(2):34-41. [Editor's Notes: Presents title study. Contact: Trace Examination Section, Forensic Chemistry Center, United States Food and Drug Administration, Cincinnati, OH, USA.]
2. Rotherham D, Harbison SA. **Differentiation of drug and non-drug Cannabis using a single nucleotide polymorphism (SNP) assay.** Forensic Science International 2011;207(1-3):193-197. [Editor's Notes: Presents title study. Contact: Department of Chemistry, University of Auckland, Private Bag 92019, Auckland 1142, New Zealand.]
3. Taniguchi M, Yamamoto Y, Nishi K. **A technique combining trifluoroacetyl derivatization and gas chromatography-mass spectrometry to distinguish methamphetamine and its 4-substituted analogs.** Journal of Mass Spectrometry 2010;45(12):1473-1476. [Editor's Notes: Reports a method using trifluoroacetyl (TFA) derivatization and GC/MS to distinguish methamphetamine and its 4-substituted analogs: 4-fluoromethamphetamine, 4-chloromethamphetamine, 4-bromomethamphetamine, 4-iodomethamphetamine, and 4-nitromethamphetamine. Contact: Shiga Police Headquarters, Forensic Science Laboratory, 1-34-3, Karasaki, Otsu, Shiga, Japan 520-0106.]
2. Kikura-Hanajiri R, Kawamura M, Miyajima A, Sunouchi M, Goda Y. **Chiral analyses of dextromethorphan/levomethorphan and their metabolites in rat and human samples using LC-MS/MS.** Analytical and Bioanalytical Chemistry 2011;400(1):165-174. [Editor's Notes: An analytical method for the discrimination of dextromethorphan (an antitussive medicine) from its enantiomer, levomethorphan (a narcotic) and their metabolites in rat plasma, urine, and hair were carried out using LC-MS/MS. Complete chiral separation was achieved in 12 minutes on a Chiral CD-Ph column. The proposed methodology might be applied to the analysis of dextromethorphan /levomethorphan in forensics samples. Contact: Division of Pharmacognosy, Phytochemistry and Narcotics, National Institute of Health Sciences 1-1801, Kamiyoga, Setagaya, Tokyo 158-8501, Japan.]

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Email Address:			
Education			
College or University	Degree	Major	
Please Check Which Techniques or Equipment Are Used in Your Laboratory			
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<input type="checkbox"/>	Column Chromatography	<input type="checkbox"/>	IR
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1. Ernst L, Schiebel H, Theuring C, Lindigkeit R, Beuerle T. **Identification and characterization of JWH-122 used as new ingredient in "Spice-like" herbal incenses.** *Forensic Science International* 2011;208(1-3):e31-e35. [Editor's Notes: Presents title study. Contact: Chemistry Department, Central NMR Laboratory, Technische Universitaet Braunschweig, Hagenring 30, Braunschweig 38106, Germany.]
2. Moran CL, Le V, Chimalakonda KC, Smedley AL, Lackey FD, Owen SN, Kennedy PD, Endres GW, Ciske FL, Krameer JB, Kornilov AM, Bratton LD, Dobrowolski PJ, Wessinger WD, Fantegrossi WE, Prather PP, James LP, Radominska-Pandya A, Moran JH. **Quantitative measurement of JWH-018 and JWH-073 metabolites excreted in human urine.** *Analytical Chemistry* 2011;83(11):4228-4236. [Editor's Notes: Presents a LC-MS/MS method for the quantitative analysis of JWH-018, JWH-073, and several potential metabolites of each at urinary concentrations. The analytical procedure has high capacity for sample throughput and does not require solid phase or liquid extraction. Contact: Arkansas State Crime Laboratory, Little Rock, AR 72205, USA.]

3. Parr MK, Opfermann G, Geyer H, Westphal F, Soennichsen FD, Zapp J, Kwiatkowska D, Schaenzer W. **Seized designer supplement named "1-Androsterone": Identification as 3 $\beta$ -hydroxy-5 $\alpha$ -androst-1-en-17-one and its urinary elimination.** Steroids 2011;76(6):540-547. [Editor's Notes: This study reports the detection of a steroid in a product seized by the State Bureau of Criminal Investigation Schleswig-Holstein, Germany. The product "1-Androsterone" of the brand name "Advanced Muscle Science" was labeled to contain 100 mg of "1-Androstene-3 $\beta$ -ol,17-one" per capsule. The product was analyzed underivatized and as bis-TMS derivative by GC/MS. The steroid was identified by comparison with chemically synthesized 3 $\beta$ -hydroxy-5 $\alpha$ -androst-1-en-17-one, prepared by reduction of 5 $\alpha$ -androst-1-ene-3,17-dione with LS-Selectride, and by NMR. Semi-quantitation revealed the amount of 3 $\beta$ -hydroxy-5 $\alpha$ -androst-1-en-17-one in the capsules was as labeled. Contact: Center for Preventive Doping Research, Institute of Biochemistry, German Sport University Cologne, Am Sportpark Muengersdorf 6, Cologne 50933, Germany.]

#### **Additional References of Possible Interest:**

1. Cheng S, Huang M, Shiea J. **Thin layer chromatography/mass spectrometry.** Journal of Chromatography A 2011;1218(19):2700-2711. [Editor's Notes: A review of methodologies for direct and indirect analysis of analytes on TLC plates by mass spectroscopy. Contact: Institute of Forensic Medicine, Ministry of Justice, Taipei, Taiwan.]
2. Holzgrabe U, Malet-Martino M. **Analytical challenges in drug counterfeiting and falsification - The NMR approach.** Journal of Pharmaceutical and Biomedical Analysis 2011;55(4):679-687. [Editor's Notes: Methods which are orthogonal to the separation methods used in the pharmacopoeias are necessary to find counterfeit pharmaceuticals. Beside Raman, NIR spectroscopy, and powder X-ray analysis, NMR spectroscopy is well suited to identify and quantify a drug and its related substances. DOSY experiments are suitable to identify the ingredients of formulations and therefore to identify wrong and/or additional ingredients. This review gives an overview of the application of quantitative NMR spectroscopy and DOSY NMR in anticounterfeiting. Contact: Institute of Pharmacy and Food Chemistry, University of Wuerzburg, Am Hubland, Wuerzburg 97074, Germany.]
3. Van Eenoo P, Van Gansbeke W, De Brabanter N, Deventer K, Delbeke FT. **A fast, comprehensive screening method for doping agents in urine by gas chromatography-triple quadrupole mass spectrometry.** Journal of Chromatography A 2011;1218(21):3306-3316. [Editor's Notes: The development and validation of a fast gas chromatography/tandem mass spectrometric method for the detection of a wide range of doping agents is described. The classes of substances that can be detected by this method include anabolic steroids,  $\beta$ 2-agonists, stimulants, narcotics, hormone antagonists and modulators, and  $\beta$ -blockers. Contact: Doping Control Laboratory (DoCoLab), Ghent University (UGent), Technologiepark 30, Zwijnaarde B-9052, Belgium.]

4. Zamengo L, Frison G, Gregio M, Orru G, Sciarrone R. **Determination of illicit drugs in seized materials: Role of sampling and analysis in estimation of measurement uncertainty.** Forensic Science International 2011;208(1-3):108-123. [Editor's Notes: Presents title study. Contacts: Laboratory of Environmental Hygiene and Forensic Toxicology, Department of PreventionVeneziana, Regione Veneto, p.le San Lorenzo Giustiniani 11/E int.2 30174 Venezia Mestre ULSS12, Italy.]

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The school is open only to forensic chemists working for law enforcement agencies. It is intended for chemists who have completed their agency's internal training program and have also been working on the bench for at least one year. There is no tuition charge. The course is held at the Hyatt Place Dulles North Hotel in Sterling, Virginia (near the Washington/Dulles International Airport). A copy of the application form is reproduced on the last page of this issue of *Microgram Bulletin*. Completed applications should be mailed to the Special Testing and Research Laboratory at 22624 Dulles Summit Court, Dulles, VA 20166. For additional information, email [DEA-Forensic Chemist Seminar -at- usdoj.gov](mailto:DEA-Forensic-Chemist-Seminar-at-usdoj.gov) (replace -at- with @).

## SCIENTIFIC MEETINGS

**Title:** 40<sup>th</sup> Annual Meeting of MAFS

**Sponsoring Organization:** Midwestern Association of Forensic Scientists

**Inclusive Dates:** September 19-23, 2011

**Location:** Weston Hotel at Yorktown (Lombard, IL)

**Contact Information:** See website

**Website:** [www.mafs.net](http://www.mafs.net)

**Title:** 2011 Northwest Association of Forensic Scientists Meeting

**Sponsoring Organization:** Northwest Association of Forensic Scientists

**Inclusive Dates:** September 25-30, 2011

**Location:** Hotel Murano (Tacoma, WA)

**Contact Information:** See website

**Website:** [www.nwafs.org](http://www.nwafs.org)

**Title:** Southwestern Association of Forensic Scientists Annual Conference

**Sponsoring Organization:** Southwestern Association of Forensic Scientists

**Inclusive Dates:** October 3-7, 2011

**Location:** Houston Marriott at Texas Medical Center (Houston, TX)

**Contact Information:** See website

**Website:** [www.swafs.us](http://www.swafs.us)

**Title:** The 2011 Northeastern Association of Forensic Scientists Annual Meeting

**Sponsoring Organization:** Northeastern Association of Forensic Scientists

**Inclusive Dates:** November 1-5, 2011

**Location:** Hyatt Regency Hotel & Spa (Newport, RI)

**Contact Information:** See website

**Website:** [www.neafs.org](http://www.neafs.org)

<b>DEA State and Local Forensic Chemist Seminar Application</b>			
Name: (PRINT NAME EXACTLY AS IT IS TO APPEAR ON CERTIFICATE)		Title:	
Employer:			
Your Office Mailing Address (include city, state, and zipcode):			Length of Service:
Business Telephone: (     )     -	Business Fax: (     )     -	Date of Application:	
Email Address:			
Education			
College or University	Degree	Major	
Please Check Which Techniques or Equipment Are Used in Your Laboratory			
<input type="checkbox"/>	Color Tests	<input type="checkbox"/>	UV
<input type="checkbox"/>	Column Chromatography	<input type="checkbox"/>	IR
<input type="checkbox"/>	Microcrystal Tests	<input type="checkbox"/>	CE
<input type="checkbox"/>	Thin Layer Chromatography	<input type="checkbox"/>	GC/MS
<input type="checkbox"/>	GC	<input type="checkbox"/>	Other (please specify)
<input type="checkbox"/>	HPLC	<input type="checkbox"/>	Other (please specify)
Indicate Analytical Problem(s) Nominee Would Like to Have Covered:			
Choice of Seminar Dates:			
1st Choice:		2nd Choice:	
Laboratory Chief/Director:			
Printed Name: _____		Signature: _____	
Title: _____		Date: _____	
Phone: _____			





The U.S. Attorney General has determined that the publication of this periodical is necessary in the transaction of the public business required by the Department of Justice. Information, instruction, and disclaimers are published in the January issues.

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- AUGUST 2011 -

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### SELECTED REFERENCES

[The Selected References section is a compilation of recent publications of presumed interest to forensic chemists. Unless otherwise stated, all listed citations are published in English. Abbreviated mailing address information duplicates that which is provided by the abstracting service. Patents and Proceedings are reported only by their *Chemical Abstracts* citation number. For full text copies of any of the articles listed, you may email the DEA Library at [dea.library-at-usdoj.gov](mailto:dea.library-at-usdoj.gov).]

1. Romao W, Lalli PM, Franco MF, Sanvido G, Schwab NV, Lanaro R, Cost, JL, Sabino BD, Bueno MIMS, de Sa GF, Daroda RJ, de Souza V, Eberlin MN. **Chemical profile of meta-chlorophenylpiperazine (m-CPP) in ecstasy tablets by easy ambient sonic-spray ionization, X-ray fluorescence, ion mobility mass spectrometry and NMR.** Analytical and Bioanalytical Chemistry 2011;400(9):3053-3064. [Editor's Notes: Presents title study. Contact: ThoMSon Mass Spectrometry Laboratory, University of Campinas-UNICAMP, 13084-971 Campinas, SP, Brazil.]
2. Uchiyama N, Kikura-Hanajiri R, Ogata J, Goda Y. **Chemical analysis of synthetic cannabinoids as designer drugs in herbal products.** Forensic Science International 2010;198(1-3):31-38. [Editor's Notes: Presents title study. Contact: National Institute of Health Sciences, Setagaya-ku, Tokyo, Japan 158-8501.]
3. Westphal F, Junge T, Klein B, Fritschi G, Girreser U. **Spectroscopic characterization of 3,4-methylenedioxypyrrolidinobutyrophenone: A new designer drug with  $\alpha$ -pyrrolidinophenone structure.** Forensic Science International 2011;209(1-3):126-132. [Editor's Notes: Presents title study. Contact: Section Narcotics/Toxicology, State Bureau of Criminal Investigation Schleswig-Holstein, Muehlenweg 166, Kiel 24116, Germany.]

### Additional References of Possible Interest:

1. Fucci, N. **Maybe a new killer in illicit cocaine.** Forensic Science International 2011;209(1-3):e23-e25. [Editor's Notes: A GC/MS method for the detection of the fungicidal pesticide 2,6-disopropylnaphtalene (2,6-DIPN) in cocaine samples is presented. Contact: Institute of Legal Medicine, Catholic University of Sacred Heart, L.go F.VitoRome 1-00168, Italy.]
2. Grange AH, Sovocool GW. **Detection of illicit drugs on surfaces using direct analysis in real time (DART) time-of-flight mass spectrometry.** Rapid Communications in Mass Spectrometry 2011;25(9):1271-1281. [Editor's Notes: Methamphetamine deposited on household surfaces poses human health hazards. The National Institute for Occupational Safety and Health (NIOSH) methods for methamphetamine analysis on household surfaces require wipe sampling, extraction, clean-up, solvent exchange, derivatization, and/or mass spectral analysis using selected ion monitoring. A direct analysis in real time (DART) time-of-flight mass spectrometry method that requires only direct sampling using cotton-swab wipes is described. Each sampling requires 2 minutes and the data acquisition requires only 13 seconds. Optimum collision-induced dissociation voltages, desorption gas temperatures, and wipe sample solvents were determined for 11 drugs. Peaks were observed in analyte-ion traces for 0.025 µg/100 cm<sup>2</sup> of methamphetamine and seven other drugs. This level is half the detection limit of NIOSH methods and one-fourth of the lowest U.S. state decontamination limit for methamphetamine. Contact: ORD, NERL, Environmental Sci. Div., U.S. EPA, Las Vegas, NV, USA.]
3. Lanzaotta AC, Lakes K, Marcott C, Witkowski MR, Sommer AJ. **Analysis of counterfeit pharmaceutical tablet cores utilizing macroscopic infrared spectroscopy and infrared spectroscopic imaging.** Analytical Chemistry 2011; 83(15):5972-5978. [Editor's Notes: Presents title study. Contact: Trace Examination Section, FDA Forensic Chemistry Center, 6751 Steger Drive, Cincinnati, Ohio 45237, USA.]
4. Meng L, Wang B, Luo F, Shen G, Wang Z, Guo M. **Application of dispersive liquid-liquid microextraction and CE with UV detection for the chiral separation and determination of the multiple illicit drugs on forensic samples.** Forensic Science International 2011;209(1-3):42-47. [Editor's Notes: Presents title study. Contact: Department of Forensic Science, Chinese People's Public Security University, Beijing 100038.]
5. Weyermann C, Mimoune Y, Anglada F, Massonnet G, Esseiva P, Buzzini, P. **Applications of a transportable Raman spectrometer for the in situ detection of controlled substances at border controls.** Forensic Science International 2011; 209(1-3):21-28. [Editor's Notes: Presents title study. Contact: Institut de Police Scientifique, University of Lausanne, Batochime, Lausanne CH-1015, Switzerland.]

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## THE DEA FY 2011 STATE AND LOCAL FORENSIC CHEMISTS SEMINAR SCHEDULE

The FY 2012 schedule for the State and Local Forensic Chemists Seminar is as follows:

November 14-18, 2011

March 19-23, 2012

June 11-15, 2012

September 10-14, 2012

The school is open only to forensic chemists working for law enforcement agencies. It is intended for chemists who have completed their agency's internal training program and have also been working on the bench for at least one year. There is no tuition charge. The course is held at the Hyatt Place Dulles North Hotel in Sterling, Virginia (near the Washington/Dulles International Airport). A copy of the application form is reproduced on the last page of this issue of *Microgram Bulletin*. Completed applications should be mailed to the Special Testing and Research Laboratory at 22624 Dulles Summit Court, Dulles, VA 20166. For additional information, email [DEA-Forensic Chemist Seminar -at- usdoj.gov](mailto:DEA-Forensic-Chemist-Seminar-at-usdoj.gov) (replace -at- with @).

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Name: (PRINT NAME EXACTLY AS IT IS TO APPEAR ON CERTIFICATE)		Title:	
Employer:			
Your Office Mailing Address (include city, state, and zipcode):			Length of Service:
Business Telephone: (     )     -	Business Fax: (     )     -	Date of Application:	
Email Address:			
Education			
College or University	Degree	Major	
Please Check Which Techniques or Equipment Are Used in Your Laboratory			
<input type="checkbox"/>	Color Tests	<input type="checkbox"/>	UV
<input type="checkbox"/>	Column Chromatography	<input type="checkbox"/>	IR
<input type="checkbox"/>	Microcrystal Tests	<input type="checkbox"/>	CE
<input type="checkbox"/>	Thin Layer Chromatography	<input type="checkbox"/>	GC/MS
<input type="checkbox"/>	GC	<input type="checkbox"/>	Other (please specify)
<input type="checkbox"/>	HPLC	<input type="checkbox"/>	Other (please specify)
Indicate Analytical Problem(s) Nominee Would Like to Have Covered:			
Choice of Seminar Dates:			
1st Choice:		2nd Choice:	
Laboratory Chief/Director:			
Printed Name: _____		Signature: _____	
Title: _____		Date: _____	
Phone: _____			



*The U.S. Attorney General has determined that the publication of this periodical is necessary in the transaction of the public business required by the Department of Justice. Information, instruction, and disclaimers are published in the January issues.*

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**- SEPTEMBER 2011 -**

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**– NOTICE OF INTENT –**

[Editor's Preface: The following notice has been edited for Microgram Bulletin. See the Federal Register: September 8, 2011 (Volume 76, Number 174) (Proposed Rules) (Pages 55616-55619) for the complete text.]

**DEPARTMENT OF JUSTICE**

**Drug Enforcement Administration**

**21 CFR Part 1308**

**[Docket No. DEA-357]**

**Schedules of Controlled Substances: Temporary Placement of Three Synthetic Cathinones Into Schedule I**

**AGENCY:** Drug Enforcement Administration, Department of Justice.

**ACTION:** Notice of Intent.

**SUMMARY:** The Administrator of the Drug Enforcement Administration (DEA) is issuing this notice of intent to temporarily schedule three synthetic cathinones under the Controlled Substances Act (CSA) pursuant to the temporary scheduling provisions of **21 U.S.C. 811(h)**. The substances are 4-methyl-N-methylcathinone (mephedrone), 3,4-methylenedioxy-N-methylcathinone (methyldone), and 3,4-methylenedioxypyrovalerone (MDPV). This action is based on a finding by the Administrator that the placement of these synthetic cathinones into schedule I of the CSA is necessary to avoid an imminent hazard to the public safety. Any final order will be published in the Federal Register and may not be issued prior to October 11, 2011. Any final order will impose the administrative, civil, and criminal sanctions and regulatory controls of schedule I substances under the CSA on the manufacture, distribution, possession, importation, and exportation of these synthetic cathinones.

**FOR FURTHER INFORMATION CONTACT:** Imelda L. Paredes, Office of Diversion Control, Drug Enforcement Administration, 8701 Morrisette Drive, Springfield, Virginia 22152; Telephone (202) 307-7165.

## SUPPLEMENTARY INFORMATION:

### Background

The Comprehensive Crime Control Act of 1984 (Pub. L. 98-473), which was signed into law on October 12, 1984, amended section 201 of the CSA (**21 U.S.C. 811**) to give the Attorney General the authority to temporarily place a substance into schedule I of the CSA for one year without regard to the requirements of 21 U.S.C. 811(b) if he finds that such action is necessary to avoid imminent hazard to the public safety. 21 U.S.C. 811(h); **21 CFR 1308.49**. If proceedings to control a substance are initiated under 21 U.S.C. 811(a)(1), the Attorney General may extend the temporary scheduling up to six months. 21 U.S.C. 811(h)(2). Where the necessary findings are made, a substance may be temporarily scheduled if it is not listed in any other schedule under section 202 of the CSA (**21 U.S.C. 812**) or if there is no exemption or approval in effect under section 505 of the Federal Food, Drug, and Cosmetic Act (21 U.S.C. 355) for the substance. 21 U.S.C. 811(h)(1). The Attorney General has delegated his authority under 21 U.S.C. 811 to the Administrator of DEA. 28 CFR 0.100.

Section 201(h)(4) of the CSA (21 U.S.C. 811(h)(4)) requires the Administrator to notify the Secretary of Health and Human Services of her intention to temporarily place a substance into schedule I of the CSA.\1\

[1\ Because the Secretary of Health and Human Services has delegated to the Assistant Secretary for Health of the Department of Health and Human Services the authority to make domestic drug scheduling recommendations, for purposes of this Notice of Intent, all subsequent references to "Secretary" have been replaced with "Assistant Secretary."]

The Administrator has transmitted notice of her intent to place mephedrone, methylone, and MDPV in schedule I on a temporary basis to the Assistant Secretary by letter dated June 15, 2011. The Assistant Secretary responded to this notice by letter dated July 25, 2011, and advised that based on review by the Food and Drug Administration (FDA) there are currently no investigational new drug applications (INDs) or approved new drug applications (NDAs) for MDPV, mephedrone, or methylone. The Assistant Secretary also stated that the Department of Health and Human Services has no objection to the temporary placement of MDPV, mephedrone, and methylone into schedule I of the CSA. DEA has taken into consideration the Assistant Secretary's comments. As MDPV, mephedrone, and methylone are not currently listed in any schedule under the CSA, and as no exemptions or approvals are in effect for MDPV, mephedrone, and methylone under Section 505 of the Federal Food, Drug, and Cosmetic Act (21 U.S.C. 355), DEA believes that the conditions of **21 U.S.C. 811(h)(1)** have been satisfied. Any additional comments submitted by the Assistant Secretary in response to this notification shall also be taken into consideration before a final order is published. 21 U.S.C. 811(h)(4).

To make a finding that placing a substance temporarily into schedule I of the CSA is necessary to avoid an imminent hazard to the public safety, the Administrator is required to consider three of the eight factors set forth in section 201(c) of the CSA (**21 U.S.C. 811(c)**). These factors are as follows: The substance's history and current pattern of abuse; the scope, duration and significance of abuse; and what, if any, risk there is to the public health. 21 U.S.C. 811(c)(4)-(6). Consideration of these factors includes actual abuse, diversion from legitimate channels, and clandestine importation, manufacture, or distribution. 21 U.S.C. 811(h)(3).

A substance meeting the statutory requirements for temporary scheduling (**21 U.S.C. 811(h)(1)**) may only be placed in schedule I. Substances in schedule I are those that have a high potential for abuse, no currently accepted medical use in treatment in the United States, and lack accepted safety for use under medical supervision. Available data and information for mephedrone, methylone, and MDPV indicate that these three synthetic cathinones have a high potential for abuse, no currently accepted medical use in treatment in the United States, and lack accepted safety for use under medical supervision.

### Synthetic Cathinones

These synthetic cathinones are not currently listed in any schedule under the CSA. Synthetic cathinones are designer drugs of the phenethylamine class which are structurally and pharmacologically similar to amphetamine, 3,4-methylenedioxymethamphetamine (MDMA), cathinone and other related substances. The addition of a beta-keto ([beta]-keto) substituent to the phenethylamine core structure produces a group of substances that now have cathinone as the core structure. These substances have been used as research chemicals. There is no evidence in the scientific literature that these substances have any legitimate non-research uses and the Assistant Secretary has advised that there are no exemptions or approvals in effect under section 505 (21 U.S.C. 355) of the Federal Food, Drug and Cosmetic Act. In other words, these synthetic cathinones have



not been approved by the FDA for human consumption.

Synthetic cathinones, like amphetamine, cathinone, methcathinone, and methamphetamine, are central nervous system (CNS) stimulants. The three synthetic cathinones proposed for control, 4-methyl-N-methylcathinone (mephedrone), 3,4-methylenedioxy-N-methylcathinone (methylone), and 3,4-methylenedioxypyrovalerone (MDPV) cause sympathomimetic effects such as agitation, tachycardia, dilated pupils, hyperthermia, diaphoresis (profuse sweating), and hypertension. Because the pharmacological effects of synthetic cathinones are similar to those of methamphetamine, cathinone, methcathinone, and MDMA, the abuse of synthetic cathinones is also likely to be similar to these substances and potentially cause serious harm to the users.

Numerous retail products marketed under the guise of “bath salts” and “plant food” have been analyzed and mephedrone, methylone, and MDPV have been identified in varying mixture profiles and quantities in these products. Mephedrone, methylone, and MDPV are the most commonly encountered synthetic cathinones. These three substances represent more than 98% of the 1429 reported synthetic cathinones that have been seized by law enforcement, as reported to the National Forensic Laboratory Information System (NFLIS), a national repository of drug evidence analysis from forensic laboratories across the United States. Of all the reports of these substances recorded by NFLIS from January 2009 to June 2011, 791 reports (55%) were MDPV, 331 reports (23%) were mephedrone, and 279 reports (20%) were methylone. Thus, these three synthetic cathinones are the subject of this notice of intent.<sup>[2]</sup>

[2] See "Background, Data and Analysis of Synthetic Cathinones: Mephedrone (4-MMC), Methylone (MDMC) and 3,4-Methylenedioxy-pyrovalerone (MDPV)," dated August 2011 in this rulemaking docket found at <http://www.regulations.gov>.]

#### **Factor 4. History and Current Pattern of Abuse**

The synthetic cathinones mephedrone, methylone, and MDPV have recently emerged on the United States' illicit drug market and are being perceived as being ‘legal’ alternatives to cocaine, methamphetamine, and MDMA. Although synthetic cathinones are new to the United States' illicit drug market, they have been popular drugs of abuse in Europe since 2007. MDPV is a derivative of pyrovalerone, which is a psychoactive drug that was used to treat chronic lethargy and fatigue. Research in anti-depressant and anti-parkinson agents resulted in the development and patenting of methylone. Methylone, however, has not been approved for these purposes. There are no currently accepted medical uses in treatment in the United States for mephedrone, methylone, or MDPV.

Mephedrone, methylone, and MDPV are falsely marketed as “research chemicals,” “plant food,” or “bath salts.” They are sold at smoke shops, head shops, convenience stores, adult book stores, and gas stations. They can also be purchased on the Internet and mailed using the U.S. Postal Service or international mail services. The packages of products containing these synthetic cathinones usually have the warning “not for human consumption,” most likely in an effort to circumvent statutory restrictions for these substances. Despite disclaimers that the products are not intended for human consumption, retailers promote that routine urinalysis drug tests will not typically detect the presence of these synthetic cathinones. However, analytical methods for the detection of mephedrone, methylone, MDPV, and other synthetic cathinones have recently been developed for these substances.

Evidence indicates that mephedrone, methylone, and MDPV are being abused for their psychoactive properties. Drug surveys found that these and other synthetic cathinones are being used as recreational drugs and are used as alternatives to illicit stimulants like MDMA and cocaine. Accordingly, mephedrone, methylone, and MDPV have been identified in human urine samples that were obtained for routine drug screenings, they have been detected in samples from drivers suspected of driving under the influence, and they have been detected by drug courts during mandatory periodic drug screens. They have also been identified in biological specimens from individuals (some exhibiting symptoms of "extreme agitation" or "excited delirium") who have been arrested for possession of a controlled substance, child endangerment, or homicide. They have been detected in samples from deceased whose causes of death were reported as drug-induced toxicity, multiple drug toxicity, or other causes (e.g., blunt force trauma from a vehicular collision or suicide).

Based on studies in the scientific literature, the marketing of products that contain mephedrone, methylone, and MDPV is geared towards teens and young adults. Accordingly, reports indicate that the main users of synthetic cathinones are young male adults. These substances are also used by mid-to-late adolescents and older adults. Many of these abusers of synthetic cathinones have a previous history of drug abuse.

According to drug surveys, the reported average amount of synthetic cathinones used per dose ranged from approximately 25 to 250 milligrams and the average amount used per session (i.e., repeated administration and binging) ranged from approximately 25 milligrams to five grams depending on the substance consumed, duration of intake, and route of administration. The most common routes of administration of these substances are nasal insufflation by snorting the powder and oral ingestion by swallowing capsules or tablets. Other reported methods of administration include injection, rectal administration, and "bombing" (wrapping a dose of powder in a paper wrap and swallowing). Synthetic cathinones have also been reported to be used in binges. Reasons cited for binging include to prolong the duration of effects, to satisfy a "craving," or to satisfy a strong urge to re-dose.

According to information found in drug surveys, clinical case reports, and law enforcement reports, users have reported using products containing mephedrone, methylone, and MDPV with other synthetic cathinones (e.g., butylone, fluoromethcathinone, 4-MEC, etc.), pharmaceutical agents (e.g., lidocaine, caffeine, benzocaine, etc.), or other recreational substances (e.g., amphetamine, MDMA, cocaine, gamma-butyrolactone (GBL), kratom, N,N-benzylpiperazine (BZP), and 1-(3-trifluoromethylphenyl)-piperazine (TFMPP)). Chemical analyses of seized and purchased synthetic cathinone products indicate that some products contain multiple substances. Furthermore, investigative toxicology reports of drug screens in which more than one substance was detected indicate that users have ingested products composed of drug combinations (e.g., a tablet composed of MDPV and BZP) or multiple drug products (e.g., a MDPV powder product and a MDMA tablet).

#### **Factor 5. Scope, Duration and Significance of Abuse**

The popularity of synthetic cathinones as recreational drugs has increased since they first appeared on the United States' illicit drug market. According to forensic laboratory reports, the first appearance of these synthetic cathinones in the United States occurred in 2009. In 2009, NFLIS registered 15 exhibits from eight states containing these three synthetic cathinones. In 2010, there were 560 reports from 29 states related to these substances registered in NFLIS and in the first two quarters of 2011 (January to June 2011) there were 391.

Based on reports to DEA from law enforcement and public health officials, synthetic cathinones are becoming increasingly prevalent and abused throughout the United States. At just one United States point of entry, the U.S. Customs and Border Protection (CBP) has encountered at least 96 shipments containing primarily mephedrone, methylone, and MDPV, as well as other synthetic cathinones like 4-MEC, butylone, fluoromethcathinone, and dimethylcathinone. Most of these shipments originated in China or India and were being shipped to destinations throughout the United States such as Arizona, Alaska, Hawaii, Kansas, Louisiana, Oklahoma, Oregon, Pennsylvania, Missouri, Virginia, Washington, and West Virginia. The American Association of Poison Control Centers, a non-profit, national organization that represents the poison control centers of the United States, reported that in 2010, poison control centers took 303 calls about synthetic cathinones. However, in just the first seven months of 2011, poison control centers have already received 4,137 calls relating to these products. These calls were received in poison control centers representing at least 47 states and the District of Columbia. Individual state poison control centers have also reported an increase in the number of calls regarding "bath salts" from 2009 to 2011.

Concerns over the abuse of these and other synthetic cathinones have prompted many states to control these substances. As of July 15, 2011, at least 33 states have emergency scheduled or enacted legislation placing regulatory controls on some or many of the synthetic cathinones. These states include Alabama, Arkansas, Florida, Georgia, Hawaii, Idaho, Illinois, Indiana, Kansas, Kentucky, Louisiana, Maine, Michigan, Minnesota, Mississippi, Missouri, New Jersey, New Mexico, New York, North Carolina, North Dakota, Ohio, Oklahoma, Oregon, Pennsylvania, Texas, Tennessee, Utah, Virginia, Washington, West Virginia, Wisconsin, and Wyoming. Several countries including all members of the European Union have also placed controls on the possession and/or sale of one or more of these substances. Moreover, the use of synthetic cathinones by members of the U.S. Armed Forces is prohibited.

#### **Factor 6. What, If Any, Risk There Is to the Public Health**

The risks to the public health associated with the abuse of mephedrone, methylone, and MDPV relate to acute and long term public health and safety problems. These synthetic cathinones have become a serious drug abuse threat as there have been reports of emergency room admissions and deaths associated with the abuse of these substances.

Clinical case reports indicate that these synthetic cathinones produce a number of stimulant-like adverse effects such as palpitation, seizure, vomiting, sweating, headache, discoloration of the skin, hypertension, and hyper-reflexia. Adverse effects associated with consumption of these drugs as reported by abusers include nose-bleeds, bruxism (teeth grinding), paranoia, hot flashes, dilated pupils, blurred vision, dry mouth/thirst, palpitations, muscular tension in the jaw and limbs, headache, agitation, anxiety, tremor, and fever or sweating. Consequently, numerous individuals have presented at emergency departments in response to exposure incidents and several cases of acute toxicity have been reported for the ingestion of mephedrone, methylone, or MDPV. In addition, case reports have shown that the abuse of synthetic cathinones can lead to psychological dependence like that reported for other stimulant drugs.

According to clinical case reports, investigative toxicological reports, and autopsy reports, mephedrone, methylone, and MDPV have been implicated in drug induced overdose deaths. In at least three reported deaths, one of these synthetic cathinones was ruled as the cause of death. Other deaths involved individuals under the influence of these synthetic cathinones who acted violently and unpredictably in causing harm to themselves or others. There have also been reports in the scientific literature of deaths caused by individuals who were driving under the influence of these synthetic cathinones.

A number of synthetic cathinones and their products, as identified by CBP and reported in the scientific literature, appear to originate from foreign sources. The manufacturers and retailers who make and sell these products do not fully disclose the product ingredients including the active ingredients or the health risks and potential hazards associated with these products. This poses significant risk to abusers who may not know what they are purchasing or the risk associated with the use of those products.

Available evidence on the overall health and social risks of mephedrone, methylone, and MDPV indicates that these substances can cause acute health problems, can potentially lead to dependency, or can cause death. The abuse of synthetic cathinones has been characterized by both acute and long term public health and safety problems and has resulted in deaths.

#### **Finding of Necessity of Schedule I Scheduling To Avoid Imminent Hazard to Public Safety**

Based on the above data and information, the continued uncontrolled manufacture, distribution, importation, exportation, and abuse of mephedrone, methylone, and MDPV pose an imminent hazard to the public safety. DEA is not aware of any recognized therapeutic uses of these synthetic cathinones in the United States. A substance meeting the statutory requirements for temporary scheduling (**21 U.S.C. 811(h)(1)**) may only be placed in schedule I. Substances in Schedule I are those that have a high potential for abuse, no currently accepted medical use in treatment in the United States, and lack accepted safety for use under medical supervision. Available data and information for mephedrone, methylone, and MDPV indicate that these three synthetic cathinones have a high potential for abuse, no currently accepted medical use in treatment in the United States, and lack accepted safety for use under medical supervision.

#### **Conclusion**

This notice of intent initiates expedited temporary scheduling action and provides the 30-day notice pursuant to section 201(h) of the CSA (**21 U.S.C. 811(h)**). In accordance with the provisions of section 201(h) of the CSA (**21 U.S.C. 811(h)**), the Administrator has considered available data and information and has set forth herein the grounds for her determination that it is necessary to temporarily schedule three synthetic cathinones, 4-methyl-N-methylcathinone (mephedrone), 3,4-methylenedioxy-N-methylcathinone (methylone), and 3,4-methylenedioxy-pyrovalerone (MDPV) in Schedule I of the CSA to avoid an imminent hazard to the public safety.

Because the Administrator hereby finds that it is necessary to temporarily place these synthetic cathinones into Schedule I to avoid an imminent hazard to the public safety, any subsequent final order temporarily scheduling these substances will be effective on the date of publication in the Federal Register, and will be in effect for a period of up to 18 months pending completion of the permanent or regular scheduling process. It is the intention of the Administrator to issue such a final order as soon as possible after the expiration of 30 days from the date of publication of this notice. Mephedrone, methylone, and MDPV will then be subject to the regulatory controls and administrative, civil and criminal sanctions applicable to the manufacture, distribution, possession, importing and exporting of a Schedule I controlled substance under the CSA.

Regular scheduling actions in accordance with **21 U.S.C. 811(a)** are subject to formal rulemaking procedures done "on the record after opportunity for a hearing" conducted pursuant to the provisions of 5 U.S.C. 556 and

557. The CSA sets forth specific criteria for scheduling a drug or other substance. While temporary scheduling orders are not subject to judicial review (21 U.S.C. 811(h)(6)), the regular scheduling process of formal rulemaking affords interested parties with appropriate process and the government with any additional relevant information needed to make a determination. Final decisions which conclude the regular scheduling process of formal rulemaking are subject to judicial review. **21 U.S.C. 877.**

#### **List of Subjects in 21 CFR Part 1308**

Administrative practice and procedure, Drug traffic control, Reporting and recordkeeping requirements.

Under the authority vested in the Attorney General by Section 201(h) of the CSA (**21 U.S.C. 811(h)**), and delegated to the Administrator of the DEA by Department of Justice regulations (28 CFR 0.100), the Administrator hereby intends to order that 21 CFR Part 1308 be amended as follows:

#### **PART 1308--SCHEDULES OF CONTROLLED SUBSTANCES**

1. The authority citation for part 1308 continues to read as follows:

Authority: **21 U.S.C. 811, 812, 871(b)**, unless otherwise noted.

2. Section 1308.11 is amended by adding new paragraphs (g)(6), (7) and (8) to read as follows:

##### **Sec. 1308.11 Schedule I.**

\* \* \* \* \*

(g) \* \* \*

(6) 4-methyl-N-methylcathinone--1248 (Other names: mephedrone)

(7) 3,4-methylenedioxymethyl-N-methylcathinone--7540 (Other names: methylone)

(8) 3,4-methylenedioxypyrovalerone--7535 (Other names: MDPV)

Dated: September 1, 2011.

**Michele M. Leonhart,**  
*Administrator.*

[FR Doc. 2011-23012 Filed 9-7-11; 8:45 am]

BILLING CODE 4410-09-P

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#### **SELECTED REFERENCES**

[The Selected References section is a compilation of recent publications of presumed interest to forensic chemists. Unless otherwise stated, all listed citations are published in English. Abbreviated mailing address information duplicates that which is provided by the abstracting service. Patents and Proceedings are reported only by their *Chemical Abstracts* citation number. For full text copies of any of the articles listed, you may email the DEA Library at dea.library -at- usdoj.gov.]

1. Abdel-Hay KM, Awad T, DeRuiter J, Clark CR. **Differentiation of methylenedioxybenzylpiperazines (MDBPs) and methoxymethylbenzylpiperazines (MMBPs) by GC-IRD and GC-MS.** Forensic Science International 2011;210(1-3):122-128. [Editor's Notes: Presents title study. Contact: Dept. of Pharmacal Sciences, Harrison School of Pharmacy, Auburn University, Auburn, AL 36849, USA.]

2. Brandt SD, Sumnall HR, Measham F, Cole J. **Analyses of second-generation ‘legal highs’ in the UK: Initial findings.** Drug Testing and Analysis 2010;2(8):377-382. [Editor’s Notes: Twenty-four ‘legal high’ products were purchased online from 18 UK-based websites over a period of six week following the ban in April 2010. Qualitative analyses were carried out by GC/MS using electron- and chemical ionization modes, NMR spectroscopy, and comparison with reference standards. Overall, the purchased products consisted of single cathinones or cathinone mixtures including mephedrone, butylone, 4-methyl-N-ethylcathinone, flephedrone (4-fluoromethcathinone) and MDPV (3,4-methylenedioxypyrovalerone). Benzocaine, caffeine, lidocaine, and procaine were also detected. An emphasis was placed on ‘Energy 1’ (NRG-1), a product advertised as a legal replacement for mephedrone-type cathinone derivatives usually claiming to contain naphyrone (naphthylpyrovalerone). It was found that 70% of NRG-1 and NRG-2 products appeared to contain a mixture of cathinones banned in April 2010 and rebranded as ‘new’ legal highs, rather than legal chemicals such as naphyrone as claimed by the retailers. Only one out of 13 NRG-1 samples had analytical data consistent with naphyrone. Contact: School of Pharmacy and Biomolecular Sciences, Liverpool John Moores University, Liverpool, United Kingdom L3 3AF.]
3. Jankovics P, Varadi A, Toelgyesi L, Lohner S, Nemeth-Palotas J, Koszegi-Szalai H. **Identification and characterization of the new designer drug 4'-methylethcathinone (4-MEC) and elaboration of a novel liquid chromatography-tandem mass spectrometry (LC-MS/MS) screening method for seven different methcathinone analogs.** Forensic Science International 2011;210(1-3):213-220. [Editor’s Notes: Presents title study. Contact: Zrinyi u. 3., National Institute of Pharmacy, PO Box 450, Budapest H-1051, Hungary.]
4. Maher HM, Awad T, DeRuiter J, Clark CR. **GC-IRD methods for the identification of some tertiary amines related to MDMA.** Forensic Science International 2010; 199(1-3):18-28. [Editor’s Notes: Presents title study. Contact: Department of Pharmaceutical Analytical Chemistry, Faculty of Pharmacy, Alexandria University, Alexandria, Egypt 21521.]
5. Russell MJ, Bogun B. **New “party pill” components in New Zealand: The synthesis and analysis of some  $\beta$ -ketone analogues of 3,4-methylenedioxymethamphetamine (MDMA) including  $\beta$ k-DMBDB ( $\beta$ -ketone-N,N-dimethyl-1-(1,3-benzodioxol-5-yl)-2-butanamine).** Forensic Science International 2011;210(1-3):174-181. [Editor’s Notes: Presents title study. Contact: Institute of Environmental Science and Research (ESR) Limited, Mt Albert Science Centre, Hampstead Road, Sandringham, Auckland, New Zealand.]
6. Wood JL, Steiner RR. **Purification of pharmaceutical preparations using thin-layer chromatography to obtain mass spectra with Direct Analysis in Real Time and accurate mass spectrometry.** Drug Testing and Analysis 2011;3(6):345-351. [Editor’s Notes: Presents title study. Contact: Department of Forensic Science, Virginia Commonwealth University, Richmond, VA 23284, USA.]

### Additional References of Possible Interest:

1. Bendinskas K, Sattelberg P, Crossett D, Banyikwa A, Dempsey D, MacKenzie JA. **Enzymatic detection of  $\gamma$ -hydroxybutyrate using aldo-keto reductase 7A2.** Journal of Forensic Sciences 2011;56(3):783-787. [Editor's Notes: Presents title study. Contact: Department of Chemistry, SUNY-Oswego, Oswego, NY 13126, USA.]
2. Dahlen J, Lundquist P, Jonsson M. **Spontaneous formation of  $\gamma$ -hydroxybutyric acid from  $\gamma$ -butyrolactone in tap water solutions.** Forensic Science International 2011;210(1-3):247-256. [Editor's Notes: Presents title study. Contact: Swedish National Laboratory of Forensic Science - SKL, Linköping SE-581 94, Sweden.]
3. Lanzarotta A, Lakes K, Marcott CA, Witkowski MR, Sommer AJ. **Analysis of counterfeit pharmaceutical tablet cores utilizing macroscopic infrared spectroscopy and infrared spectroscopic imaging.** Analytical Chemistry 2011;83(15):5972-5978. [Editor's Notes: Advantages and limitations of analyzing authentic and counterfeit pharmaceutical tablets with both macro (non-imaging) attenuated total internal reflection Fourier transform IR (ATR-FTIR) spectroscopy and micro ATR-FTIR spectroscopic imaging have been evaluated. The results of this study demonstrated that micro ATR imaging was more effective for extracting formulation information (sourcing), whereas a macro ATR approach was better suited for counterfeit detection (screening). More importantly, this study demonstrated that a thorough analysis of the counterfeit core can be achieved by combining the results of both techniques. Contact: Trace Examination Section, FDA Forensic Chemistry Section, FDA Forensic Chemistry Center, 6751 Steger Drive, Cincinnati, Ohio 45237, USA.]
4. Lopatka M, Vallat M. **Surface granularity as a discriminating feature of illicit tablets.** Forensic Science International 2011;210(1-3):188-194. [Editor's Notes: Presents title study. Contact: Department of Illicit Drugs, Netherlands Forensic Institute, Postbus 24044, The Hague 2490 AA, Netherlands.]
5. Liu G, Ma S, Ji T, Zhao H, Wang W. **Differentiation of illicit drugs with THz timedomain spectroscopy.** Nuclear Science and Techniques 2010;21(4):209-213. [Editor's Notes: Presents title study. Contact: Shanghai Institute of Applied Physics, Chinese Academy of Sciences, Shanghai, Peoples Republic of China 201800.]
6. Mazel V, Reiche I, Busignies V, Walter P, Tchoreloff P. **Confocal micro-X-ray fluorescence analysis as a new tool for the non-destructive study of the elemental distributions in pharmaceutical tablets.** Talanta 2011;85(1):556-561. [Editor's Notes: Determining the distribution of the different compounds inside the tablet is an important issue for both production quality control and counterfeit detection. Most of the currently used techniques are limited to the study of the surface of the compacts, whereas the study of the bulk requires time-consuming sample preparation. The use of 3D micro-X-ray fluorescence analysis (3D $\mu$ XRF) for the non-destructive study of pharmaceutical tablets is demonstrated. This study shows that it is possible to measure the distribution of several inorganic elements from the surface to a depth of several hundred microns. The ability to this technique to measure the thickness of tablet coatings is also demonstrated. Contact: EA 401, UFR de Pharmacie, Laboratoire "Materiaux et sante," Univ. Paris-Sud, Chateauf-Malabry 92240, France.]



7. Nelson HC, Gardner EA, Matteo D. **Microcrystal analysis of cocaine hydrochloride and added adulterants.** Journal of Forensic Sciences 2011;56(3):736-740. [Editor's Notes: The changes in crystal morphology of cocaine in the presence of common adulterants, caffeine and lidocaine hydrochloride, is presented. Contact: Department of Justice Sciences, University of Alabama at Birmingham, Birmingham, AL, USA.]
8. Niessen WMA. **Fragmentation of toxicologically relevant drugs in positive-ion liquid chromatography-tandem mass spectrometry.** Mass Spectrometry Reviews 2011;30(4):626-663. [Editor's Note: The positive ion MS/MS spectra of approximately 570 compounds were interpreted by chemical and therapeutic class. The study places an emphasis on class-specific fragmentation rather than the fragmentation of each individual compound. Contact: Hyphen MassSpec, de Wetstraat 8, Leiden 2332 XT, Netherlands.]
9. Pelander A, Decker P, Baessmann C, Ojanpera I. **Evaluation of a high resolving power time-of-flight mass spectrometer for drug analysis in terms of resolving power and acquisition rate.** Journal of the American Society for Mass Spectrometry 2011;22(2):379-385. [Editor's Notes: The performance of a high resolving power TOFMS instrument was evaluated for drug analysis. Flow injection analysis of critical drug mixtures, including a total of 17 compounds with nominal masses of 212-415 Da and with mass differences of 8.8-23.5 mDa, Resolving Power (RP) varied from 34,400 to 51,900 (FWHM). The effect of acquisition rate on RP, mass accuracy, and isotopic pattern fit was studied by applying 1, 2, 5, 10, and 20 Hz acquisition rates in a 16 min gradient elution LC separation. All three variables were independent of the acquisition rate, with an average mass accuracy and isotopic pattern fit factor (mSigma) of 0.33ppm and 5.9, respectively. The average relative standard deviation of RP was 1.8%, showing high repeatability. Contact: Hjelt Institute, Department of Forensic Medicine, University of Helsinki, Helsinki FI- 00014, Finland.]

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## THE DEA FY 2011 STATE AND LOCAL FORENSIC CHEMISTS SEMINAR SCHEDULE

The FY 2012 schedule for the State and Local Forensic Chemists Seminar is as follows:

November 14-18, 2011

March 19-23, 2012

June 11-15, 2012

September 10-14, 2012

The school is open only to forensic chemists working for law enforcement agencies. It is intended for chemists who have completed their agency's internal training program and have also been working on the bench for at least one year. There is no tuition charge. The course is held at the Hyatt Place Dulles North Hotel in Sterling, Virginia (near the Washington/Dulles International Airport). A copy of the application form is reproduced on the last page of this issue of *Microgram Bulletin*. Completed applications should be mailed to the Special Testing and Research Laboratory at 22624 Dulles Summit Court, Dulles, VA 20166. For additional information, email [DEA-Forensic Chemist Seminar -at- usdoj.gov](mailto:DEA-Forensic-Chemist-Seminar-at-usdoj.gov) (replace -at- with @).

## SCIENTIFIC MEETINGS

**Title:** Southwestern Association of Forensic Scientists Annual Conference  
**Sponsoring Organization:** Southwestern Association of Forensic Scientists  
**Inclusive Dates:** October 3-7, 2011  
**Location:** Houston Marriott at Texas Medical Center (Houston, TX)  
**Contact Information:** See website  
**Website:** [www.swafs.us](http://www.swafs.us)

**Title:** The 2011 Northeastern Association of Forensic Scientists Annual Meeting  
**Sponsoring Organization:** Northeastern Association of Forensic Scientists  
**Inclusive Dates:** November 1-5, 2011  
**Location:** Hyatt Regency Hotel & Spa (Newport, RI)  
**Contact Information:** See website  
**Website:** [www.neafs.org](http://www.neafs.org)

<b>DEA State and Local Forensic Chemist Seminar Application</b>			
Name: (PRINT NAME EXACTLY AS IT IS TO APPEAR ON CERTIFICATE)		Title:	
Employer:			
Your Office Mailing Address (include city, state, and zipcode):			Length of Service:
Business Telephone: (     )     -	Business Fax: (     )     -	Date of Application:	
Email Address:			
Education			
College or University	Degree	Major	
Please Check Which Techniques or Equipment Are Used in Your Laboratory			
<input type="checkbox"/>	Color Tests	<input type="checkbox"/>	UV
<input type="checkbox"/>	Column Chromatography	<input type="checkbox"/>	IR
<input type="checkbox"/>	Microcrystal Tests	<input type="checkbox"/>	CE
<input type="checkbox"/>	Thin Layer Chromatography	<input type="checkbox"/>	GC/MS
<input type="checkbox"/>	GC	<input type="checkbox"/>	Other (please specify)
<input type="checkbox"/>	HPLC	<input type="checkbox"/>	Other (please specify)
Indicate Analytical Problem(s) Nominee Would Like to Have Covered:			
Choice of Seminar Dates:			
1st Choice:		2nd Choice:	
Laboratory Chief/Director:			
Printed Name: _____		Signature: _____	
Title: _____		Date: _____	
Phone: _____			



The U.S. Attorney General has determined that the publication of this periodical is necessary in the transaction of the public business required by the Department of Justice. Information, instruction, and disclaimers are published in the January issues.

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- OCTOBER 2011 -

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### SELECTED REFERENCES

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1. Bononi M, Belgi P, Tateo F. **Analytical data for identification of the cannabimimetic phenylacetylindole JWH-203.** *Journal of Analytical Toxicology* 2011;35(6):360-363. [Editor's Notes: Presents title study. Contact: Laboratori di Ricerche Analitiche e Tecnologiche su Alimenti e Ambiente, Faculty of Agriculture, University of Milan, Milan 20133, Italy.]
2. Hudson S, Ramsey J. **The emergence and analysis of synthetic cannabinoids.** *Drug Testing and Analysis* 2011;3(7-8):466-478. [Editor's Notes: This paper presents background information on the pharmacological aspects of synthetic cannabinoids, as well as, GC/MS and LC-MS/MS data obtained from the analysis of several products containing synthetic cannabinoids. Contact: HFL Sport Science Ltd, Newmarket Road, Fordham CB7 5WW, United Kingdom.]
3. Nakajima J, Takahashi M, Seto T, Kanai C, Suzuki J, Yoshida M, Hamano T. **Identification and quantitation of two benzoylindoles AM-694 and (4-methoxyphenyl)(1-pentyl-1H-indol-3-yl)methanone, and three cannabimimetic naphthoylindoles JWH-210, JWH-122, and JWH-019 as adulterants in illegal products obtained via the Internet.** *Forensic Toxicology* 2011;29(2):95-110. [Editor's Notes: Presents title study. Contact: Division of Drugs, Tokyo Metropolitan Institute of Public Health 3-24-1 Hyakunin-cho, Shinjuku-ku, Tokyo 169-0073, Japan.]

### Additional References of Possible Interest:

1. Been F, Roggo Y, Degardin K, Esseiva P, Margot P. **Profiling of counterfeit medicines by vibrational spectroscopy.** Forensic Science International 2011;211(1-3):83-100. [Editor's Notes: Presents title study. Contact: F. Hoffmann-La Roche Ltd., Basel, Switzerland.]
2. Bell C, George C, Kicman AT, Traynor A. **Development of a rapid LC-MS/MS method for direct urinalysis of designer drugs.** Drug Testing and Analysis 2011; 3(7-8):496-504. [Editor's Notes: Presents title study. Contact: Department of Forensic Science and Drug Monitoring, Kings College London, School of Biomedical and Health Sciences, Franklin-Wilkins Building 150 Stamford Street SE1 9NH, United Kingdom.]
3. Collins M. **Some new psychoactive substances: Precursor chemicals and synthesis-driven end-products.** Drug Testing and Analysis 2011;3(7-8):404-416. [Editor's Notes: Some of the new classes of designer drugs being encountered today by forensic scientists and law enforcement agencies (cathinones, tryptamines, phenethylamines, and synthetic cannabinoids) are described. The synthetic approaches used to manufacture many of these designer drugs are also presented. Many of these so-called designer drugs exist as a result of legitimate research into medical conditions and the natural product chemistry. A link between synthetic approaches published in the open scientific and medical literature, and the exploitation of this research by clandestine manufacturers of drugs for illicit purposes is drawn. Contact: Australian Forensic Drug Laboratory, National Measurement Institute Australia.]
4. Sainsbury PD, Kicman AT, Archer RP, King LA, Braithwaite RA. **Aminoindanes-the next wave of 'legal highs'?** Drug Testing and Analysis 2011;3(7-8):479-482. [Editor's Notes: Internet websites offering synthetic compounds as research chemicals have recently been advertising 5,6-methylenedioxy-2-aminoindane (MDAI), 5,6-methylenedioxy-N-methyl-2-aminoindane (MDMAI), 5-iodo-2-aminoindane (5-IAI), and 5-methoxy-6-methyl-2-aminoindane (MMAI) for sale. The chemical, pharmacological, and toxicological aspects of these new psychoactive substances are reviewed. Contact: Department of Forensic Science and Drug Monitoring, Franklin-Wilkins Building, King's College London SE1 9 NH, United Kingdom.]

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The FY 2012 schedule for the State and Local Forensic Chemists Seminar is as follows:

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Name: (PRINT NAME EXACTLY AS IT IS TO APPEAR ON CERTIFICATE)		Title:	
Employer:			
Your Office Mailing Address (include city, state, and zipcode):			Length of Service:
Business Telephone: (     )     -	Business Fax: (     )     -	Date of Application:	
Email Address:			
Education			
College or University	Degree	Major	
Please Check Which Techniques or Equipment Are Used in Your Laboratory			
<input type="checkbox"/>	Color Tests	<input type="checkbox"/>	UV
<input type="checkbox"/>	Column Chromatography	<input type="checkbox"/>	IR
<input type="checkbox"/>	Microcrystal Tests	<input type="checkbox"/>	CE
<input type="checkbox"/>	Thin Layer Chromatography	<input type="checkbox"/>	GC/MS
<input type="checkbox"/>	GC	<input type="checkbox"/>	Other (please specify)
<input type="checkbox"/>	HPLC	<input type="checkbox"/>	Other (please specify)
Indicate Analytical Problem(s) Nominee Would Like to Have Covered:			
Choice of Seminar Dates:			
1st Choice:		2nd Choice:	
Laboratory Chief/Director:			
Printed Name: _____		Signature: _____	
Title: _____		Date: _____	
Phone: _____			



*The U.S. Attorney General has determined that the publication of this periodical is necessary in the transaction of the public business required by the Department of Justice. Information, instruction, and disclaimers are published in the January issues.*

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– NOVEMBER 2011 –

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– SCHEDULING UPDATE –

[Editor's Preface: The following notice has been edited for Microgram Bulletin. See the Federal Register: October 21, 2011 (Volume 76, Number 204) (Rules and Regulations) (Pages 65371-65375) for the complete text.]

**DEPARTMENT OF JUSTICE**

**Drug Enforcement Administration**

**21 CFR Part 1308**

**[Docket No. DEA-357]**

**Schedules of Controlled Substances: Temporary Placement of Three Synthetic Cathinones Into Schedule I**

**AGENCY:** Drug Enforcement Administration, Department of Justice.

**ACTION:** Final Order.

**SUMMARY:** The Administrator of the Drug Enforcement Administration (DEA) is issuing this final order to temporarily schedule three synthetic cathinones under the Controlled Substances Act (CSA) pursuant to the temporary scheduling provisions of **21 U.S.C. 811(h)**. The substances are 4-methyl-N-methylcathinone (mephedrone), 3,4-methylenedioxy-N-methylcathinone (methylone), and 3,4-methylenedioxypyrovalerone (MDPV). This action is based on a finding by the Administrator that the placement of these synthetic cathinones and their salts, isomers, and salts of isomers into Schedule I of the CSA is necessary to avoid an imminent hazard to the public safety. As a result of this order, the full effect of the CSA and its implementing regulations including criminal, civil and administrative penalties, sanctions and regulatory controls of Schedule I substances will be imposed on the manufacture, distribution, possession, importation, and exportation of these synthetic cathinones.

**DATES:** Effective Date: This Final Order is effective on October 21, 2011.

**FOR FURTHER INFORMATION CONTACT:** Imelda L. Paredes, Office of Diversion Control, Drug Enforcement Administration, 8701 Morrisette Drive, Springfield, Virginia 22152; Telephone (202) 307-7165.

## SUPPLEMENTARY INFORMATION:

### Background

The Comprehensive Crime Control Act of 1984 (Pub. L. 98-473), which was signed into law on October 12, 1984, amended section 201 of the CSA (**21 U.S.C. 811**) to give the Attorney General the authority to temporarily place a substance into Schedule I of the CSA for one year without regard to the requirements of 21 U.S.C. 811(b) if he finds that such action is necessary to avoid imminent hazard to the public safety, 21 U.S.C. 811(h); **21 CFR 1308.49**. If proceedings to control a substance are initiated under 21 U.S.C. 811(a)(1), the Attorney General may extend the temporary scheduling up to an additional six months, 21 U.S.C. 811(h)(2). Where the necessary findings are made, a substance may be temporarily scheduled in Schedule I if it is not listed in any other schedule under section 202 of the CSA (**21 U.S.C. 812**) or if there is no exemption or approval in effect under section 505 of the Federal Food, Drug, and Cosmetic Act (21 U.S.C. 355) for the substance, 21 U.S.C. 811(h)(1). The Attorney General has delegated his authority under 21 U.S.C. 811 to the Administrator of DEA, 28 CFR 0.100.

Section 201(h)(4) of the CSA (**21 U.S.C. 811(h)(4)**) requires the Administrator to notify the Secretary of Health and Human Services of her intention to temporarily place a substance into Schedule I of the CSA.<sup>[1]</sup>

The Administrator transmitted notice of her intent to place mephedrone, methylone and MDPV in Schedule I on a temporary basis to the Assistant Secretary in a letter dated June 15, 2011. The Assistant Secretary responded to this notice by letter dated July 25, 2011, and advised that based on review by the Food and Drug Administration (FDA) there are currently no investigational new drug applications (INDs) or approved new drug applications (NDAs) for MDPV, mephedrone, or methylone. The Assistant Secretary also stated that the Department of Health and Human Services has no objection to the temporary placement of MDPV, mephedrone, and methylone into Schedule I of the CSA. DEA has taken into consideration the Assistant Secretary's comments. As MDPV, mephedrone, and methylone are not currently listed in any schedule under the CSA, as no exemptions or approvals are in effect for MDPV, mephedrone, and methylone under section 505 of the Federal Food, Drug, and Cosmetic Act (21 U.S.C. 355), and as this temporary scheduling is necessary to avoid an imminent hazard to the public safety, DEA believes that the conditions of **21 U.S.C. 811(h)(1)** have been satisfied.

[1] Because the Secretary of Health and Human Services has delegated to the Assistant Secretary for Health of the Department of Health and Human Services the authority to make domestic drug scheduling recommendations, for purposes of this Final Order, all subsequent references to "Secretary" have been replaced with "Assistant Secretary."

A notice of intent to temporarily place mephedrone, methylone, and MDPV into Schedule I of the CSA was published in the Federal Register on September 8, 2011 (76 FR 55616). The data in support of the notice of intent and additional data continue to support the necessary findings to place mephedrone, methylone, and MDPV temporarily into Schedule I of the CSA as necessary to avoid an imminent hazard to the public safety.<sup>[2]</sup> In making this finding, the Administrator is required to consider three of the eight factors set forth in section 201(c) of the CSA (**21 U.S.C. 811(c)**). These factors are as follows: The substance's history and current pattern of abuse; the scope, duration and significance of abuse; and what, if any, risk there is to the public health, 21 U.S.C. 811(c) (4)-(6). Consideration of these factors includes actual abuse, diversion from legitimate channels, and clandestine importation, manufacture, or distribution, 21 U.S.C. 811(h)(3).

[2] See "Background, Data and Analysis of Synthetic Cathinones: Mephedrone (4-MMC), Methylone (MDMC) and 3,4-Methylenedioxy-pyrovalerone (MDPV)" found at <http://www.regulations.gov>.

Mephedrone, methylone, and MDPV are not currently listed in any schedule under the CSA. The temporary placement of these three synthetic cathinones into Schedule I of the CSA is necessary in order to avoid an imminent hazard to the public safety. First, there has been a rapid and significant increase in abuse of these substances in the United States. As a result of this abuse, synthetic cathinones are banned in at least 37 states in the United States and several countries, and all five branches of the U.S. military prohibit military personnel from possessing or using synthetic cathinones. Second, law enforcement has seized synthetic cathinones and, based on self-reports to law enforcement and health care professionals, synthetic cathinones are abused for their psychoactive properties. Third, federal, state and local public health departments and poison control centers have issued reports describing public health consequences such as emergency department visits and deaths from the use of these synthetic cathinones. Based on scientific data currently available, these three substances have the potential to be extremely harmful and, therefore, pose an imminent hazard to the public safety.

#### **Factor 4: History and Current Pattern of Abuse**

Synthetic cathinones are designer drugs of the phenethylamine class which are structurally and pharmacologically similar to amphetamine, 3,4-methylenedioxymethamphetamine (MDMA), cathinone, and other related substances. The addition of a beta-keto ([beta]-keto) substituent to the phenethylamine core structure produces a group of substances that now have cathinone as the core structure. Synthetic cathinones, like amphetamine, cathinone, methcathinone, and methamphetamine, are central nervous system (CNS) stimulants.

The synthetic cathinones mephedrone, methylone, and MDPV have recently emerged on the United States' illicit drug market and are being perceived as being 'legal' alternatives to cocaine, methamphetamine, and MDMA. Although synthetic cathinones are new to the United States' illicit drug market, they have been popular drugs of abuse in Europe since 2007. MDPV is a derivative of pyrovalerone, which is a psychoactive drug that was used to treat chronic lethargy and fatigue. Research in anti-depressant and anti-parkinson agents resulted in the development and patenting of methylone. Methylone, however, has not been approved for these purposes. There are no currently accepted medical uses in treatment in the United States for mephedrone, methylone, or MDPV.

Mephedrone, methylone, and MDPV are falsely marketed as "research chemicals," "plant food," or "bath salts." They are sold at smoke shops, head shops, convenience stores, adult book stores, and gas stations. They can also be purchased on the Internet and mailed using the U.S. Postal Service or international mail services. The packages of products containing these synthetic cathinones usually have the warning "not for human consumption," most likely in an effort to circumvent statutory restrictions for these substances. Despite disclaimers that the products are not intended for human consumption, retailers promote that routine urinalysis drug tests will not typically detect the presence of these synthetic cathinones. However, analytical methods for the detection of mephedrone, methylone, MDPV, and other synthetic cathinones have recently been developed for these substances.

Evidence indicates that mephedrone, methylone, and MDPV are being abused for their psychoactive properties. Drug surveys found that these and other synthetic cathinones are being used as recreational drugs and are used as alternatives to illicit stimulants like MDMA and cocaine. Accordingly, mephedrone, methylone, and MDPV have been identified in human urine samples that were obtained for routine drug screenings, they have been detected in samples from drivers suspected of driving under the influence, and they have been detected by drug courts during mandatory periodic drug screens. They have also been identified in biological specimens from individuals (some exhibiting symptoms of "extreme agitation" or "excited delirium") who have been arrested for possession of a controlled substance, child endangerment, or homicide. They have been detected in samples from decedents whose causes of death were reported as drug-induced toxicity, multiple drug toxicity, or other causes (e.g., blunt force trauma from a vehicular collision or suicide).

Based on studies in the scientific literature, the marketing of products that contain mephedrone, methylone, and MDPV is geared towards teens and young adults. Accordingly, reports indicate that the main users of synthetic cathinones are young male adults. These substances are also used by mid-to-late adolescents and older adults. Many of these abusers of synthetic cathinones have a previous history of drug abuse.

According to drug surveys, the reported average amount of synthetic cathinones used per dose ranged from approximately 25 to 250 milligrams and the average amount used per session (i.e., repeated administration and binging) ranged from approximately 25 milligrams to 5 grams depending on the substance consumed, duration of intake, and route of administration. The most common routes of administration of these substances are nasal insufflation by snorting the powder and oral ingestion by swallowing capsules or tablets. Other reported methods of administration include injection, rectal administration, and "bombing" (wrapping a dose of powder in a paper wrap and swallowing). Synthetic cathinones have also been reported to be used in binges. Reasons cited for binging include to prolong the duration of effects, to satisfy a "craving," or to satisfy a strong urge to re-dose.

According to information found in drug surveys, clinical case reports, and law enforcement reports, users have reported using products containing mephedrone, methylone, and MDPV with other synthetic cathinones (e.g., butylone, fluoromethcathinone, 4-MEC, etc.), pharmaceutical agents (e.g., lidocaine, caffeine, benzocaine, etc.), or other recreational substances (e.g., amphetamine, MDMA, cocaine, gamma-butyrolactone (GBL), kratom, N-benzylpiperazine (BZP), and 1-(3-trifluoromethylphenyl)-piperazine (TFMPP)). Chemical analyses of seized and purchased synthetic cathinone products indicate that some products contain multiple substances. Furthermore, investigative toxicology reports of drug screens in which more than one substance was detected indicate that users have ingested products composed of drug combinations (e.g., a tablet composed of MDPV and BZP) or multiple drug products (e.g., a MDPV powder product and a MDMA tablet).

## **Factor 5: Scope, Duration and Significance of Abuse**

The popularity of synthetic cathinones as recreational drugs has increased since they first appeared on the United States' illicit drug market. According to forensic laboratory reports, the first appearance of these synthetic cathinones in the United States occurred in 2009. In 2009, NFLIS registered 15 exhibits from 8 states containing these three synthetic cathinones. In 2010, there were 574 reports from 29 states related to these substances registered in NFLIS, and in 2011 (January to August) there were 995.<sup>3</sup>

[<sup>3</sup> Analyzed on September 15, 2011.]

Based on reports to DEA from law enforcement and public health officials, synthetic cathinones are becoming increasingly prevalent and abused throughout the United States. At one United States point of entry, the U.S. Customs and Border Protection (CBP) has encountered at least 127 shipments containing primarily mephedrone, methylone, and MDPV, as well as other synthetic cathinones like 4-MEC, butylone, fluoromethcathinone, and dimethylcathinone. Most of these shipments originated in China or India and were being shipped to destinations throughout the United States such as Arizona, Alaska, Hawaii, Kansas, Louisiana, Oklahoma, Oregon, Pennsylvania, Missouri, Virginia, Washington, and West Virginia. The American Association of Poison Control Centers (AAPCC), a non-profit, national organization that represents the poison control centers of the United States, reported that in 2010, poison control centers took 303 calls about synthetic cathinones. However, in just the first eight months of 2011, poison control centers have already received 4,720 calls relating to these products. These calls were received in poison control centers representing at least 47 states and the District of Columbia. Individual state poison control centers have also reported an increase in the number of calls regarding "bath salts" from 2009 to 2011.

Concerns over the abuse of these and other synthetic cathinones have prompted many states to control these substances. As of September 15, 2011, at least 37 states have emergency scheduled or enacted legislation placing regulatory controls on some or many of the synthetic cathinones. These states include Alabama, Arkansas, Connecticut, Florida, Georgia, Hawaii, Idaho, Illinois, Indiana, Iowa, Kansas, Kentucky, Louisiana, Maine, Maryland, Michigan, Minnesota, Mississippi, Missouri, New Jersey, New Mexico, New York, North Carolina, North Dakota, Ohio, Oklahoma, Oregon, Pennsylvania, Texas, Tennessee, Utah, Vermont, Virginia, Washington, West Virginia, Wisconsin and Wyoming. Several countries including all members of the European Union have also placed controls on the possession and/or sale of one or more of these substances. Moreover, the use of synthetic cathinones by members of the U.S. Armed Forces is prohibited.

## **Factor 6: What, if Any, Risk There Is to the Public Health**

The risks to the public health associated with the abuse of mephedrone, methylone, and MDPV relate to acute and long term public health and safety problems. These synthetic cathinones have become a serious drug abuse threat as there have been reports of emergency room admissions and deaths associated with the abuse of these substances.

Clinical case reports indicate that these synthetic cathinones produce a number of stimulant-like adverse effects such as palpitation, seizure, vomiting, sweating, headache, discoloration of the skin, hypertension, and hyper-reflexia. Adverse effects associated with consumption of these drugs as reported by abusers include nose-bleeds, bruxism (teeth grinding), paranoia, hot flashes, dilated pupils, blurred vision, dry mouth/thirst, palpitations, muscular tension in the jaw and limbs, headache, agitation, anxiety, tremor, and fever or sweating. Consequently, numerous individuals have presented at emergency departments in response to exposure incidents and several cases of acute toxicity have been reported due to the ingestion of mephedrone, methylone, or MDPV. In addition, case reports have shown that the abuse of synthetic cathinones can lead to psychological dependence like that reported for other stimulant drugs.

According to clinical case reports, investigative toxicological reports, and autopsy reports, mephedrone, methylone, and MDPV have been implicated in drug induced overdose deaths. In at least three reported deaths, one of these synthetic cathinones was ruled as the cause of death. Other deaths involved individuals under the influence of these synthetic cathinones who acted violently and unpredictably in causing harm to themselves or others. There have also been reports in the scientific literature of deaths caused by individuals who were driving under the influence of these synthetic cathinones.

A number of synthetic cathinones and their products, as identified by CBP and reported in the scientific literature, appear to originate from foreign sources. The manufacturers and retailers who make and sell these products do not fully disclose the product ingredients including the active ingredients or the health risks and potential hazards associated with these products. This poses significant risk to abusers who may not know what they are purchasing or the risk associated with the use of those products.

Based on the above data, the continued uncontrolled manufacture, distribution, importation, exportation, and abuse of mephedrone, methylone, and MDPV pose an imminent hazard to the public safety. DEA is not aware of any recognized therapeutic uses of these synthetic cathinones in the United States.

DEA has considered the three criteria for placing a substance into Schedule I of the CSA (**21 U.S.C. 812**), and finds that the data available and reviewed for mephedrone, methylone, and MDPV indicate that these synthetic cathinones each have a high potential for abuse, no currently accepted medical use in treatment in the United States, and lack accepted safety for use under medical supervision.

In accordance with the provisions of section 201(h) of the CSA (**21 U.S.C. 811(h)**) and 28 CFR 0.100, the Administrator has considered the available data and the three factors required to support a determination to temporarily schedule three synthetic cathinones (4-methyl-N-methylcathinone, 3,4-methylenedioxy-N-methylcathinone, and 3,4-methylenedioxypyrovalerone) in Schedule I of the CSA and finds that placement of these synthetic cathinones and their salts, isomers, and salts of isomers into Schedule I of the CSA is necessary to avoid an imminent hazard to the public safety.

## **Regulatory Requirements**

[Editor's Note: See the Federal Register for the Regulatory Requirements.]

### **List of Subjects in 21 CFR Part 1308**

Administrative practice and procedure, Drug traffic control, Reporting and recordkeeping requirements.

Under the authority vested in the Attorney General by section 201(h) of the CSA (**21 U.S.C. 811(h)**), and delegated to the Administrator of the DEA by Department of Justice regulations (28 CFR 0.100), the Administrator hereby orders that **21 CFR Part 1308** be amended as follows:

### **PART 1308--SCHEDULES OF CONTROLLED SUBSTANCES**

1. The authority citation for Part 1308 continues to read as follows:

Authority: **21 U.S.C. 811, 812, 871(b)**, unless otherwise noted.

2. **Section 1308.11** is amended by adding new paragraphs (g)(6), (7) and (8) to read as follows:

#### **Sec. 1308.11 Schedule I.**

\* \* \* \* \*

(g) \* \* \*

(6) 4-methyl-N-methylcathinone--1248

(Other names: mephedrone)

(7) 3,4-methylenedioxy-N-methylcathinone--7540

(Other names: methylone)

(8) 3,4-methylenedioxypyrovalerone--7535

(Other names: MDPV)

\* \* \* \* \*

Dated: October 14, 2011.

**Michele M. Leonhart,**  
*Administrator.*

[FR Doc. 2011-27282 Filed 10-20-11; 8:45 am]

BILLING CODE 4410-09-P



**– PROPOSED RULE –**

[Editor's Preface: The following notice has been edited for Microgram Bulletin. See the Federal Register: October 21, 2011 (Volume 76, Number 204) (Proposed Rules) (Pages 65424-65428) for the complete text.]

**DEPARTMENT OF JUSTICE**

**Drug Enforcement Administration**

**21 CFR Part 1308**

**[Docket No. DEA-354]**

**Schedules of Controlled Substances: Placement of Ezogabine Into Schedule V**

**AGENCY:** Drug Enforcement Administration, Department of Justice.

**ACTION:** Notice of proposed rulemaking.

**SUMMARY:** The Drug Enforcement Administration (DEA) proposes placing the substance ezogabine, including its salts, isomers, and salts of isomers whenever the existence of such salts, isomers, and salts of isomers is possible, into Schedule V of the Controlled Substances Act (CSA). This proposed action is pursuant to the CSA which requires that such actions be made on the record after opportunity for a hearing through formal rulemaking.

**DATES:** DEA will permit interested persons to file written comments on this proposal pursuant to **21 CFR 1308.43(g)**. Electronic comments must be submitted and written comments must be postmarked on or before November 21, 2011. Commenters should be aware that the electronic Federal Docket Management System will not accept comments after midnight Eastern Time on the last day of the comment period.

Interested persons, defined as those "adversely affected or aggrieved by any rule or proposed rule issuable pursuant to section 201 of the Act (**21 U.S.C. 811**)," may file a request for hearing pursuant to **21 CFR 1308.44** and in accordance with **21 CFR 1316.45** and **1316.47**. Requests for hearing, notices of appearance, and waivers of participation must be received on or before November 21, 2011.

[**21 CFR 1300.01**.]

**ADDRESSES:** To ensure proper handling of comments, please reference "Docket No. DEA-354" on all electronic and written correspondence. DEA encourages all comments be submitted electronically through <http://www.regulations.gov> using the electronic comment form provided on that site. An electronic copy of this document and supplemental information to this proposed rule are also available at the <http://www.regulations.gov> Web site for easy reference. Paper comments that duplicate the electronic submission are not necessary as all comments submitted to <http://www.regulations.gov> will be posted for public review and are part of the official docket record. Should you, however, wish to submit written comments via regular or express mail, they should be sent to the Drug Enforcement Administration, Attention: DEA Federal Register Representative/OD, 8701 Morrisette Drive, Springfield, VA 22152. All requests for hearing must be sent to Drug Enforcement Administration, Attention: Hearing Clerk/LJ, 8701 Morrisette Drive, Springfield, VA 22152.

**FOR FURTHER INFORMATION CONTACT:** Rhea D. Moore, Office of Diversion Control, Drug Enforcement Administration, 8701 Morrisette Drive, Springfield, Virginia 22152; Telephone (202) 307-7165.

**SUPPLEMENTARY INFORMATION:**

**Posting of Public Comments:** Please note that all comments received are considered part of the public record and made available for public inspection online at <http://www.regulations.gov> and in the DEA's public docket. Such information includes personal identifying information (such as your name, address, etc.) voluntarily submitted by the commenter.

If you want to submit personal identifying information (such as your name, address, etc.) as part of your comment, but do not want it to be posted online or made available in the public docket, you must include the phrase

“PERSONAL IDENTIFYING INFORMATION” in the first paragraph of your comment. You must also place all of the personal identifying information you do not want posted online or made available in the public docket in the first paragraph of your comment and identify what information you want redacted.

If you want to submit confidential business information as part of your comment, but do not want it to be posted online or made available in the public docket, you must include the phrase “CONFIDENTIAL BUSINESS INFORMATION” in the first paragraph of your comment. You must also prominently identify confidential business information to be redacted within the comment. If a comment has so much confidential business information that it cannot be effectively redacted, all or part of that comment may not be posted online or made available in the public docket.

Personal identifying information and confidential business information identified and located as set forth above will be redacted, and the comment, in redacted form, will be posted online and placed in the DEA's public docket file. Please note that the Freedom of Information Act applies to all comments received. If you wish to inspect the agency's public docket file in person by appointment, please see the “For Further Information” paragraph.

### **Request for Hearing, Notice of Appearance at or Waiver of Participation in Hearing**

[Editor's Note: See the Federal Register for information on Requests for Hearing, Notice of Appearance at or Waiver of Participation in Hearing.]

### **Legal Authority**

[Editor's Note: See the Federal Register for the Legal Authority.]

### **Background**

Ezogabine, known chemically as N-[2-amino-4-(4-fluorobenzylamino)-phenyl]-carbamic acid ethyl ester, is a new chemical substance with central nervous system depressant properties and is classified as a sedative-hypnotic. Pharmacological studies indicate that ezogabine primarily acts as a ligand at ion-gated channels in the brain to enhance potassium currents mediated by neuronal KCNQ (Kv7) channels. Additionally, ezogabine indirectly enhances the gamma-aminobutyric acid (GABA) mediated neurotransmission. On June 10, 2011, the Food and Drug Administration (FDA) approved a New Drug Application (NDA) for ezogabine as an adjunct treatment of partial onset seizures, to be marketed under the trade name Potiga.<sup>2</sup>

[<sup>2</sup> [http://www.accessdata.fda.gov/drugsatfda\\_docs/nda/2011/022345Orig1s000TOC.cfm](http://www.accessdata.fda.gov/drugsatfda_docs/nda/2011/022345Orig1s000TOC.cfm); as of July 21, 2011.]

### **Proposed Determination to Schedule Ezogabine**

Pursuant to **21 U.S.C. 811(a)**, proceedings to add a drug or substance to those controlled under the CSA may be initiated by request of the Secretary of HHS. On January 12, 2011, HHS provided DEA with a scientific and medical evaluation document prepared by FDA entitled “Basis for the Recommendation for Control of Ezogabine in Schedule V of the Controlled Substances Act.” Pursuant to **21 U.S.C. 811(b)**, this document contained an eight-factor analysis of the abuse potential of ezogabine as a new drug, along with HHS' recommendation to control ezogabine under Schedule V of the CSA.

In response, DEA conducted an eight-factor analysis of ezogabine's abuse potential pursuant to **21 U.S.C. 811(c)**. Included below is a brief summary of each factor as analyzed by HHS and DEA, and as considered by DEA in the scheduling decision. Please note that both the DEA and HHS analyses are available in their entirety under “Supporting and Related Material” of the public docket for this rule at [www.regulations.gov](http://www.regulations.gov) under docket number DEA-354.

*1. The Drug's Actual or Relative Potential for Abuse:* Ezogabine is a new chemical substance that has not been marketed in the U.S. or in any other country. As such, there is no information available which details actual abuse of ezogabine. However, the legislative history of the CSA offers another methodology for assessing a drug or substance's potential for abuse:

The drug or drugs containing such a substance are new drugs so related in their action to a drug or drugs already listed as having a potential for abuse to make it likely that the drug will have the same

potentiality for abuse as such drugs, thus making it reasonable to assume that there may be significant diversions from legitimate channels, significant use contrary to or without medical advice, or that it has a substantial capability of creating hazards to the health of the user or to the safety of the community.\3\

[3\ Comprehensive Drug Abuse Prevention and Control Act of 1970, H.R. Rep. No. 91-1444, 91st Cong., Sess. 1 (1970); 1970 U.S.C.C.A.N. 4566, 4601.]

Ezogabine acts as a ligand at ion-gated channels in the brain, similar to the Schedule V substances pregabalin and lacosamide, and, like those drugs, ezogabine is indicated for the treatment of epileptic conditions in humans. There is strong evidence, described below, that ezogabine produces behavioral effects in humans and in animals that are similar to those produced by pregabalin and lacosamide.

Phase 1 clinical studies indicate that the rate of euphoria-related adverse events (AEs) resulting from administration of ezogabine was 6-9%. This is similar to the AE rates for administration of pregabalin (10%) and lacosamide (>7%), while Phase 2/3 clinical studies indicated similar AE rates between ezogabine (<1%) and lacosamide (<2%). Animal studies involving administration of ezogabine to animals produced a sedative behavioral profile similar to that produced from administration of pregabalin and lacosamide, including decreased locomotion, decreased muscle tone, and an increase in ataxia. Further, in abuse potential studies conducted with sedative-hypnotic abusers, ezogabine, pregabalin, and lacosamide, when compared to placebos, are similar in their ability to produce statistically significant increases in subjective responses including "Drug Liking," "Euphoria," "Overall Drug Liking," "Good Drug Effects," and "High."

Because of the similarities between ezogabine, pregabalin, and lacosamide, it is very likely that ezogabine will have an abuse potential similar to those Schedule V substances. Currently there is a lack of evidence regarding the diversion, illicit manufacturing or deliberate misuse of ezogabine due to its commercial unavailability in any country, but since ezogabine is not readily synthesized from available substances, any diversion would be from legitimate channels. The above referenced studies, which include demonstration of the significant euphoric effects produced by ezogabine in humans, predict that there will be significant use of ezogabine contrary to or without medical advice.

*2. Scientific Evidence of the Drug's Pharmacological Effects, If Known:* Ezogabine acts to enhance potassium currents mediated by neuronal KCNQ (Kv7) channels with a secondary action through the augmentation of GABA-mediated neurotransmission without direct GABA receptor stimulation. In individuals with histories of recreational sedative-hypnotic abuse, ezogabine (300 and 600 mg orally) produced increased ratings on the primary positive subjective scales [VAS-Drug-liking, VAS-Overall Drug Liking, ARCI-MBG (Euphoria), VAS-Take Drug Again] for peak responses (Emax for the first eight hours after drug administration) that were significantly different from the placebo. This effect is similar to that produced by alprazolam (1.5 and 3.0 mg orally; Schedule IV). On secondary positive subjective scales [VAS-High, VAS-Good Effects, ARCI-Amphetamine (Activation)] for peak responses, both ezogabine and alprazolam produced significant increases compared to the placebo, while there were no differences between ezogabine and alprazolam on those measures.

In human abuse potential studies, ezogabine (300 and 600 mg), upon oral administration, increased ratings on negative and sedating subjective measures [VAS-Bad Effects, ARCI-LSD (dysphoria) and ARCI-PCAG (sedation)] compared to the placebo, but these increases were lower than those produced by 1.5 and 3.0 mg alprazolam. These data for ezogabine are similar to those produced by lacosamide. A 900 mg dose of ezogabine produced VAS-Drug Liking and VAS-Good Effects that were higher than those produced by the two lower doses of ezogabine and either dose of alprazolam. However, the changes in VAS-Bad Effects and ARCI-LSD (dysphoria) following 900 mg ezogabine were less than or similar to those produced by lower doses of ezogabine and either dose of alprazolam. The adverse events following 900 mg ezogabine are similar to those described in the NDA for the human abuse potential study conducted with lacosamide. These included euphoria, somnolence, visual disturbances, and altered auditory perception.

In human abuse potential studies, ezogabine, similar to pregabalin and lacosamide, also produced ratings on each of the positive subjective responses that were statistically similar to those produced by Schedule IV benzodiazepines (alprazolam or diazepam). Although this appears to suggest that these drugs have an abuse potential similar to that of Schedule IV substances, the other data from human abuse potential studies, the adverse effect profile data from safety and efficacy studies, and the data from the preclinical animal behavioral studies demonstrate that ezogabine has abuse potential less than that of Schedule IV drugs but similar to that of Schedule V drugs.

*3. The State of Current Scientific Knowledge Regarding the Drug or Other Substance:* The chemical name of ezogabine is N-[2-amino-4-(4-fluorobenzylamino)-phenyl]-carbamic acid ethyl ester. It is an achiral molecule with a molecular formula of  $C_{16}H_{18}FN_3O_2$  and a molecular weight of 303.3 g/mol. Ezogabine is a non-hygroscopic white to slightly colored powder with a melting point of 140-143°C. It is soluble in 0.9% saline, methanol, chloroform, but only sparingly soluble in ethanol and 0.1N HCl.

Ezogabine in humans has a  $T_{max}$  (time required for ezogabine to reach maximum plasma concentration) ranging from 1-4 hours following both acute and multiple dosing, and, without the involvement of cytochrome P450, undergoes an extensive and almost exclusively phase 2 metabolic biotransformation. Ezogabine is predominantly metabolized by N-glucuronidation, resulting in the formation of two distinct N-glucuronides of the unchanged parent drug and to a lesser extent by N-acetylation to form N-acetyl-retigabine, the major bioactive metabolite of ezogabine. The half-life of both ezogabine and N-acetyl-retigabine is approximately eight hours and the  $C_{max}$  (maximum plasma concentration) of both components is dose proportional after both acute and multiple dosing, suggesting a lack of accumulation with repeated administration.

*4. Its History and Current Pattern of Abuse:* As stated in the summary of Factor 1, information on ezogabine's history and current pattern of abuse is unavailable as it has not been marketed in any country. As such, evaluation of abuse potential for ezogabine derives from positive indicators in clinical studies which are believed to be predictive of drug abuse and which are discussed in Factors 1 and 2 above.

*5. The Scope, Duration, and Significance of Abuse:* Because ezogabine has not been marketed in any country, information on the scope, duration, and significance of abuse of ezogabine is unavailable. However, epidemiological data on pregabalin, a Schedule V drug with an abuse potential similar to that of ezogabine, is available from the Drug Abuse Warning Network (DAWN) database.

The "abuse frequency ratio," calculated as the ratio of nonmedical use related annual emergency department visits (as reported in DAWN) to the total number of annual prescriptions for pregabalin is less than that for the Schedule IV drug, alprazolam. Further, because ezogabine has abuse-related human and animal data in its NDA similar to data generated for pregabalin, ezogabine is likely to have an abuse potential similar to pregabalin. The "abuse frequency ratios" for pregabalin range from 29 to 47, while those for alprazolam are approximately three to six times higher, ranging from 160 to 235. Thus, pregabalin was placed into Schedule V based both on abuse-related human and animal data submitted in its NDA and by epidemiological data which justified placement relative to drugs in Schedule IV. Given that ezogabine has abuse-related human and animal data in its NDA similar to the data generated by pregabalin, it is likely that ezogabine will have an abuse potential similar to this Schedule V drug.

*6. What, if any, Risk There is to the Public Health:* The data indicates that ezogabine may present a serious safety risk to the public health, and the predicted level of risk is similar to that observed with pregabalin and lacosamide but less than that produced by Schedule IV benzodiazepines. In Phase 1 clinical safety studies, the overall adverse event profile following ezogabine administration was similar to those from pregabalin and lacosamide and includes not only euphoria, but also somnolence, and feeling or thinking abnormally. Further, the human abuse potential study showed that the majority of subjects receiving the 900 mg dose of ezogabine experienced multiple adverse events such as euphoria, somnolence, visual disturbance, amnesia, hypo-aesthesia, paranoia, fear, confusion and hallucination. Although the 900 mg dose is three times greater than the recommended therapeutic dose, individuals who abuse drugs typically do so at supra-therapeutic doses.

*7. Its Psychic or Physiological Dependence Liability:* Ezogabine may produce limited psychic or physiological dependence liability following extended administration. Since there are no studies detailing abrupt discontinuation of ezogabine, there are minimal adequate data to evaluate the ability of ezogabine to induce withdrawal symptoms that are indicative of physical dependence. Many of the adverse events reported from the discontinuation of ezogabine were also reported prior to its discontinuation, including dizziness, somnolence, and a state of confusion. By comparison, abrupt or rapid discontinuation of pregabalin in human studies resulted in patient-reported symptoms of nausea, headache or diarrhea, which are suggestive of physical dependence, while abrupt termination of lacosamide produced no signs or symptoms of withdrawal in diabetic neuropathic pain patients.

Unlike ezogabine and pregabalin, the withdrawal syndrome following discontinuation of Schedule IV substances such as alprazolam can range from mild dysphoria and insomnia to a major syndrome including abdominal pain, muscle cramps, vomiting, sweating, tremors and convulsions. These are similar in character to those associated with other sedative-hypnotics.

The study of ezogabine abuse potential in humans with histories of recreational abuse of sedative-hypnotics found that ezogabine produces euphoria (18-33%) in these individuals. Additionally, ezogabine produced euphoria (8.5%) in Phase 1 studies in healthy individuals. These euphoria-related adverse events following administration of ezogabine are suggestive of its ability to produce psychic dependence, and the adverse events appear to be less severe and occur less frequently than Schedule IV drugs (diazepam and alprazolam) and are more similar to those of Schedule V drugs, pregabalin and lacosamide.

*8. Whether the Substance is an Immediate Precursor of a Substance Already Controlled Under the CSA:* Ezogabine is not an immediate precursor of any controlled substance.

*Conclusion:* Based on consideration of the scientific and medical evaluation and accompanying recommendation of HHS, and based on DEA's consideration of its own eight-factor analysis, DEA finds that these facts and all relevant data constitute substantial evidence of potential for abuse of ezogabine. As such, DEA hereby proposes to schedule ezogabine as a controlled substance under the CSA.

### **Proposed Determination of Appropriate Schedule**

The CSA establishes five schedules of controlled substances known as Schedules I, II, III, IV, and V. The statute outlines the findings required to place a drug or other substance in any particular schedule. **21 U.S.C. 812(b)**. After consideration of the analysis and recommendation of the Assistant Secretary for Health of HHS and review of all available data, the Administrator of DEA, pursuant to 21 U.S.C. 812(b)(5), finds that:

- (1) Ezogabine has a low potential for abuse relative to the drugs or other substances in Schedule IV. The overall abuse potential of ezogabine is comparable to the Schedule V substances such as pregabalin and lacosamide;
- (2) Ezogabine has a currently accepted medical use in treatment in the United States. Ezogabine was approved for marketing by FDA as an adjunct treatment of partial onset seizures; and
- (3) Abuse of ezogabine may lead to limited physical dependence or psychological dependence relative to the drugs or other substances in Schedule IV.

Based on these findings, the Administrator of DEA concludes that ezogabine, including its salts, isomers and salts of isomers, whenever the existence of such salts, isomers, and salts of isomers is possible, warrants control in Schedule V of the CSA (**21 U.S.C. 812(b)(5)**).

### **Requirements for Handling Ezogabine**

[Editor's Note: See the Federal Register for the Requirements for Handling Ezogabine.]

### **Regulatory Analyses**

[Editor's Note: See the Federal Register for the Regulatory Analyses.]

### **List of Subjects in 21 CFR Part 1308**

Administrative practice and procedure, Drug traffic control, Reporting and recordkeeping requirements. For the reasons set out above, 21 CFR part 1308 is proposed to be amended to read as follows:

### **PART 1308--SCHEDULES OF CONTROLLED SUBSTANCES**

1. The authority citation for **21 CFR part 1308** continues to read as follows:  
Authority: **21 U.S.C. 811, 812, 871(b)**, unless otherwise noted.
2. **Section 1308.15** is amended by redesignating paragraphs (e)(1) and (2) as paragraphs (e)(2) and (3), and adding a new paragraph (e)(1) to read as follows:

Sec. 1308.15 Schedule V.

\* \* \* \* \*

(e) \* \* \*

(1) Ezogabine--2779

\* \* \* \* \*

Dated: October 14, 2011.

**Michele M. Leonhart,**

*Administrator.*

[FR Doc. 2011-27253 Filed 10-20-11; 8:45 am]

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### SELECTED REFERENCES

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1. Ali EMA, Edwards HGM, Scowen IJ. **Rapid in situ detection of street samples of drugs of abuse on textile substrates using microRaman spectroscopy.** *Spectrochimica Acta, Part A: Molecular and Biomolecular Spectroscopy* 2011;80(1): 2-7. [Editor's Notes: Presents title study. Contact: Raman Spectroscopy Group, Division of Chemical and Forensic Sciences, University of Bradford, Bradford BD7 1DP, United Kingdom.]
2. Emanuel CEJ, Ellison B, Banks CE. **Spice up your life: Screening the illegal components of 'Spice' herbal products.** *Analytical Methods* 2010;2(6):614-616. [Editor's Notes: Presents GC/MS and Solid Probe MS methods for the analysis of "Spice" related samples. Contact: Faculty of Science and Engineering, School of Biology, Chemistry and Health Science, Division of Chemistry and Materials, Manchester Metropolitan University, Manchester, UK M1 5GD, United Kingdom.]
3. Morrison C, Smith FJ, Tomaszewski T, Stawiarska K, Biziuk M. **Chiral gas chromatography as a tool for investigations into illicitly manufactured methylamphetamine.** *Chirality* 2011;23(7):519-522. [Editor's Notes: Presents a gas chromatographic method for the separation of the isomers of methamphetamine, ephedrine, pseudoephedrine, and the intermediates of the EMDE synthesis of methamphetamine. Contact: School of Science, University of the West of Scotland, Paisley, United Kingdom.]



4. Samms WC, Jiang YJ, Dixon MD, Houck SS, Mozayani A. **Analysis of alprazolam by DART-TOF mass spectrometry in counterfeit and routine drug identification cases.** Journal of Forensic Sciences 2011;56(4):993-998. [Editor's Notes: Presents title study. Contact: Harris County Institute of Forensic Sciences, Houston, TX 77054, USA.]

#### **Additional References of Possible Interest:**

1. Elsohly MA, Gul W, Elsohly KM, Murphy TP, Madgula VLM, Khan SI. **Liquid chromatography-tandem mass spectrometry analysis of urine specimens for K2 (JWH-018) metabolites.** Journal of Analytical Toxicology 2011;35(7):487-495. [Editor's Notes: Presents title study. Contact: ElSohly Laboratories, Inc., 5 Industrial Park Drive, Oxford, MS 38655, USA; National Center for Natural Products Research and Department of Pharmaceutics, The University of Mississippi, University, MS 38677, USA.]
2. Jin MJ, Jin C, Kim JY, In MK, Kwon OS, Yoo HH. **A quantitative method for simultaneous determination of 5-methoxy-N,N-diisopropyltryptamine and its metabolites in urine using liquid chromatography-electrospray ionization-tandem mass spectrometry.** Journal of Forensic Sciences 2011;56(4):1044-1048. [Editor's Notes: Presents title study. Contact: Doping Control Center, Korea Institute of Science and Technology, Seoul 130-650, South Korea.]
3. Mitrevski B, Wynne P, Marriott PJ. **Comprehensive two-dimensional gas chromatography applied to illicit drug analysis.** Analytical and Bioanalytical Chemistry 2011;401(8):2361-2371. [Editor's Notes: Presents a review of 2D GC analysis of illicit drugs. Contact: Centre for Green Chemistry, School of Chemistry, Monash University, VIC 3800, Australia.]
4. Prajapati P, Prajapati A. **Raman spectroscopy: A versatile tool in pharmaceutical analysis.** International Journal of Pharmaceutical Sciences Review and Research 2011;9(1):57-64. [Editor's Notes: Presents title review. Contact: Department of Pharmaceutical Chemistry, SSR College of Pharmacy, Silvassa, India.]
5. Tobias HJ, Zhang Y, Auchus RJ, Brenna JT. **Detection of synthetic testosterone use by novel comprehensive two-dimensional gas chromatography combustion-isotope ratio mass spectrometry.** Analytical Chemistry 2011;83(18):7158-7165. [Editor's Notes: Presents title study. Contact: Division of Nutritional Sciences, Cornell University, Ithaca, NY 14853, USA.]

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## THE JOURNAL/TEXTBOOK COLLECTION EXCHANGE

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2. *Journal of Forensic Sciences*, 1975, Issue #4.
3. *BDAC Bulletin*, Issues 2, 3, and 7 (these date from about 1968) – originals or good photocopies.
4. *BNDD Bulletin*, Issue 1 (April, 1969) – original or a good photocopy.

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## SCIENTIFIC MEETINGS

**Title:** AAFS 64<sup>th</sup> Annual Scientific Meeting  
**Sponsoring Organization:** American Academy of Forensic Sciences  
**Inclusive Dates:** February 20-25, 2012  
**Location:** Atlanta Marriott Marquis (Atlanta, GA)  
**Contact Information:** See website  
**Website:** [www.aafs.org](http://www.aafs.org)

<b>DEA State and Local Forensic Chemist Seminar Application</b>			
Name: (PRINT NAME EXACTLY AS IT IS TO APPEAR ON CERTIFICATE)		Title:	
Employer:			
Your Office Mailing Address (include city, state, and zipcode):			Length of Service:
Business Telephone: (     )     -	Business Fax: (     )     -	Date of Application:	
Email Address:			
Education			
College or University	Degree	Major	
Please Check Which Techniques or Equipment Are Used in Your Laboratory			
<input type="checkbox"/>	Color Tests	<input type="checkbox"/>	UV
<input type="checkbox"/>	Column Chromatography	<input type="checkbox"/>	IR
<input type="checkbox"/>	Microcrystal Tests	<input type="checkbox"/>	CE
<input type="checkbox"/>	Thin Layer Chromatography	<input type="checkbox"/>	GC/MS
<input type="checkbox"/>	GC	<input type="checkbox"/>	Other (please specify)
<input type="checkbox"/>	HPLC	<input type="checkbox"/>	Other (please specify)
Indicate Analytical Problem(s) Nominee Would Like to Have Covered:			
Choice of Seminar Dates:			
1st Choice:		2nd Choice:	
Laboratory Chief/Director:			
Printed Name: _____		Signature: _____	
Title: _____		Date: _____	
Phone: _____			



The U.S. Attorney General has determined that the publication of this periodical is necessary in the transaction of the public business required by the Department of Justice. Information, instruction, and disclaimers are published in the January issues.

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– DECEMBER 2011 –

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1. Lesar CT, Decatur J, Lukasiewicz E, Champeil E. **Report on the analysis of common beverages spiked with gamma-hydroxybutyric acid (GHB) and gamma-butyrolactone (GBL) using NMR and the PURGE solvent-suppression technique.** Forensic Science International 2011;212(1-3):e40-e45. [Editor's Notes: The identification of GHB and GBL using  $^1\text{H}$  NMR using the Presaturation Utilizing Relaxation Gradients and Echoes (PURGE) water suppression method is presented. The use of the PURGE method allowed for the identification and quantitation GHB and GBL in most of the alcoholic beverages tested. Contact: Department of Science, John Jay College of Criminal Justice, City University of New York, 445 West 59th Street, New York, NY 10019, USA.]
2. McDermott SD, Power JD, Kavanagh P, O'Brien J. **The analysis of substituted cathinones. Part 2: An investigation into the phenylacetone based isomers of 4-methylmethcathinone and N-ethylcathinone.** Forensic Science International 2011;212(1-3):13-21. [Editor's Notes: Presents title study. Contact: Forensic Science Laboratory, Garda HQ, Dublin 8, Ireland.]

3. Power JD, McGlynn P, Clarke K, McDermott SD, Kavanagh P, O'Brien J. **The analysis of substituted cathinones. Part 1: Chemical analysis of 2-, 3- and 4-methylmethcathinone.** Forensic Science International 2011;212(1-3):6-12. [Editor's Notes: Presents title study. Contact: Forensic Science Laboratory, Garda HQ, Dublin 8, Ireland.]
4. Santali EY, Cadogan AK, Daeid NN, Savage KA, Sutcliffe OB. **Synthesis, full chemical characterization and development of validated methods for the quantification of (±)-4'-methylmethcathinone (mephedrone): A new "legal high."** Journal of Pharmaceutical and Biomedical Analysis 2011;56(2):246-255. [Editor's Notes: Presents title study. Contact: Strathclyde Institute of Pharmacy and Biomedical Sciences (SIPBS), University of Strathclyde, Glasgow G4 0RE, United Kingdom.]

#### **Additional References of Possible Interest:**

1. Bussy U, Thibaudeau C, Thomas F, Desmurs JR, Jamin E, Remaud GS, Silvestre V, Akoka S. **Isotopic finger-printing of active pharmaceutical ingredients by <sup>13</sup>C NMR and polarization transfer techniques as a tool to fight against counterfeiting.** Talanta 2011;85(4):1909-1914. [Editor's Notes: Presents title study. Contact: CNRS, Chimie et Interdisciplinarite: Synthese, Analyse et Modelisation (CEISAM), UMR 6230, Universite de Nantes, Nantes F-44322, France.]
2. Schneider S, Meys F. **Analysis of illicit cocaine and heroin samples seized in Luxembourg from 2005-2010.** Forensic Science International 2011;212(1-3):242-246. [Editor's Notes: Discusses the trends observed in the analysis of 471 illicit cocaine and 962 illicit heroin samples seized in Luxembourg from January 2005 through December 2010. Contact: Laboratoire National de Sante, Division de Toxicologie, 162a, Universite du Luxembourg, avenue de la Faiencerie, Luxembourg L-1511, Luxembourg.]
3. Olds WJ, Jaatinen E, Fredericks P, Cletus B, Panayiotou H, Izake EL. **Spatially offset Raman spectroscopy (SORS) for the analysis and detection of packaged pharmaceuticals and concealed drugs.** Forensic Science International 2011; 212(1-3):69-77. [Editor's Notes: The use of spatially offset Raman spectroscopy (SORS) as a means for the identification of identifying concealed substances is presented. SORS is compared to existing Raman techniques, including confocal microscopy, wide area illumination, and conventional backscattered Raman spectroscopy. Contact: Discipline of Chemistry, Faculty of Science and Technology, Queensland University of Technology, 2 George Street, Brisbane 4001, Australia.]
4. Drake SJ, Morrison C, Smith F. **Simultaneous chiral separation of methylamphetamine and common precursors using gas chromatography/mass spectrometry.** Chirality 2011;23(8):593-601. [Editor's Notes: A GC/MS method for the chiral separation of the trifluoroacetic anhydride derivatives of methamphetamine, ephedrine, and pseudoephedrine is presented. Contact: School of Science, University of the West of Scotland, United Kingdom.]
5. Chernetsova ES, Bochkov PO, Zatonskii GV, Abramovich RA. **New approach to detecting counterfeit drugs in tablets by DART mass spectrometry.** Pharmaceutical Chemistry Journal 2011;45(5):306-308. [Editor's Notes: The use of DART mass

spectrometry for the identification of active ingredients in tableted drugs has been studied. Anal. results for some drugs such as glycine, nootropyl, anaprilin, mexidol, and biseptol are presented. The benefits and limitations of DART mass spectrometry as applied to fast screening of tableted pharmaceuticals for detecting counterfeits are discussed. Contact: Shared Equipment Usage Research and Education Center, People's Friendship University of Russia, Moscow 117198, Russia.]

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Allred RA	Spectral characterization of 2,4-dimethoxy-3-methylphenethylamine and comparison to 2,5-dimethoxy-4-methylphenethylamine ("2C-D").	2005	3	1-2	16-26
Allred RA.	Synthesis of trans-4-methylaminorex from norephedrine and potassium cyanate.	2005	3	3-4	154-165
Almog J	Evaluation of ninhydrin analogues and other electron-deficient compounds as spray reagents for drugs on thin layer chromatograms.	2003	1	1-2	23-31
Azoury M	Evaluation of ninhydrin analogues and other electron-deficient compounds as spray reagents for drugs on thin layer chromatograms.	2003	1	1-2	23-31
Berrier A	Detection of phenethylamine, amphetamine, and tryptamine imine by-products from an acetone extraction.	2011	8	1	29-35
Bianchi RP	Laboratory analysis of the conversion of pseudoephedrine to methamphetamine from over-the-counter products.	2005	3	1-2	11-15
Blackledge RD	Psychotria viridis - A botanical source of dimethyl-tryptamine (DMT).	2003	1	1-2	18-22
Blackledge RD	The identification of 1-dehydromethandrostenolone.	2005	3	3-4	186-189
Blackledge RD	Identification of bufotenine in yopo seeds via GC/IRD.	2006	4	1-4	3-11
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Bordelon JA	Desloratadine: The reaction byproduct of the reduction of cold tablets containing Loratadine with hydriodic acid/red phosphorus.	2005	3	1-2	69-77
Boudreau DK	An in-depth study of peruvian Base Llavada ("Washed Base") technique for purification of crude cocaine base.	2008	6	3-4	72-81
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Bruneel N	A rapid and simple GC/MS screening method for 4-methoxyphenol in illicitly prepared 4-methoxy-amphetamine (PMA).	2003	1	3-4	184-189
Bruneel N	Anise oil as a precursor for 2-alkoxy-5-methoxy-benzaldehydes.	2004	2	1-4	4-10
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Casale JF	The characterization of 4-methoxy-N-ethylamphetamine hydrochloride.	2006	4	1-4	42-46
Casale JF	Quantitation of cocaine by gas chromatography-flame ionization detection utilizing isopropylcocaine as a structurally related internal standard.	2006	4	1-4	47-53
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Casale JF	Identification of levamisole impurities found in illicit cocaine exhibits.	2008	6	3-4	82-89
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Cox KA	Rapid chiral separation of dextro- and levo- methorphan using capillary electrophoresis with dynamically coated capillaries.	2005	3	3-4	138-141
Coyle HM	An overview of DNA methods for the identification and individualization of marijuana.	2003	1	3-4	196-207
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Kiddon GS	The characterization of three FLY compounds.	2007	5	1-4	26-33
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<b>DEA State and Local Forensic Chemist Seminar Application</b>			
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Employer:			
Your Office Mailing Address (include city, state, and zipcode):			Length of Service:
Business Telephone: (     )     -	Business Fax: (     )     -	Date of Application:	
Email Address:			
Education			
College or University	Degree	Major	
Please Check Which Techniques or Equipment Are Used in Your Laboratory			
<input type="checkbox"/>	Color Tests	<input type="checkbox"/>	UV
<input type="checkbox"/>	Column Chromatography	<input type="checkbox"/>	IR
<input type="checkbox"/>	Microcrystal Tests	<input type="checkbox"/>	CE
<input type="checkbox"/>	Thin Layer Chromatography	<input type="checkbox"/>	GC/MS
<input type="checkbox"/>	GC	<input type="checkbox"/>	Other (please specify)
<input type="checkbox"/>	HPLC	<input type="checkbox"/>	Other (please specify)
Indicate Analytical Problem(s) Nominee Would Like to Have Covered:			
Choice of Seminar Dates:			
1st Choice:		2nd Choice:	
Laboratory Chief/Director:			
Printed Name: _____		Signature: _____	
Title: _____		Date: _____	
Phone: _____			



*The U.S. Attorney General has determined that the publication of this periodical is necessary in the transaction of the public business required by the Department of Justice. Information, instruction, and disclaimers are published in the January issues.*

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– JANUARY 2012 –

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– SCHEDULING UPDATE –

[Editor's Preface: The following notice has been edited for Microgram Bulletin. See the Federal Register: December 12, 2011 (Volume 76, Number 238) (Proposed Rules) (Pages 77330-77360) for the complete text.]

**DEPARTMENT OF JUSTICE**

**Drug Enforcement Administration**

**21 CFR Part 1308**

**[Docket No. DEA-333]**

**Schedules of Controlled Substances: Placement of Carisoprodol Into Schedule IV**

**AGENCY:** Drug Enforcement Administration, Department of Justice.

**ACTION:** Final rule.

**SUMMARY:** With the issuance of this final rule, the Administrator of the Drug Enforcement Administration (DEA) places the substance carisoprodol, including its salts, isomers, and salts of isomers, whenever the existence of such salts, isomers, and salts of isomers is possible, into Schedule IV of the Controlled Substances Act (CSA). This action is pursuant to the CSA which requires that such actions be made on the record after opportunity for a hearing. The decision of the Administrator is reprinted in its entirety below.

**DATES:** Effective Date: January 11, 2012.

**FOR FURTHER INFORMATION CONTACT:** Rhea D. Moore, Drug Enforcement Administration, 8701 Morrisette Drive, Springfield, Virginia 22152; Telephone (202) 307-5268.

## SUPPLEMENTARY INFORMATION:

### Background

This is a proceeding under 21 U.S.C. 811(a) for the issuance of a rule placing carisoprodol in schedule IV of the Controlled Substances Act (CSA). Under this provision, “the Attorney General may, by rule,” add a “drug or other substance” to one of the five schedules of controlled substances, “if he \* \* \* finds that such drug or other substance has a potential for abuse, and \* \* \* makes with respect to such drug or other substance the findings prescribed by [21 U.S.C. 812(b)] for the schedule in which such drug is to be placed.” 21 U.S.C. 811(a). However, a rule made under this provision “shall be made on the record after opportunity for a hearing pursuant to the rulemaking procedures prescribed by subchapter II of chapter 5 of Title 5.”

“[W]ith respect to each drug \* \* \* proposed to be controlled,” the CSA requires that the Attorney General consider eight factors in making the findings required under both subsections 811(a) and 812(b). These are:

- (1) [The drug’s] actual or relative potential for abuse.
- (2) Scientific evidence of its pharmacological effect, if known.
- (3) The state of current scientific knowledge regarding the drug or other substance.
- (4) Its history and current pattern of abuse.
- (5) The scope, duration, and significance of abuse.
- (6) What, if any, risk there is to the public health.
- (7) Its psychic or physiological dependence liability.
- (8) Whether the substance is an immediate precursor of a substance already controlled under this subchapter.

21 U.S.C. 811(c).

However, “before initiating proceedings \* \* \* to control a drug \* \* \* and after gathering the necessary data,” the Attorney General is required to “request from the Secretary a scientific and medical evaluation, and his recommendations, as to whether such drug \* \* \* should be controlled.” The statute further provides that “[i]n making such evaluation and recommendations, the Secretary shall consider the Factors listed in paragraphs (2), (3), (6), (7), and (8) of subsection (c) \* \* \* and any scientific or medical considerations involved in paragraphs (1), (4), and (5) of such subsection. The recommendations of the Secretary shall include recommendations with respect to the appropriate schedule, if any, under which such drug \* \* \* should be listed.”

Finally, “[t]he recommendations of the Secretary to the Attorney General shall be binding as to such scientific and medical matters, and if the Secretary recommends that a drug \* \* \* not be controlled, the Attorney General shall not control the drug \* \* \*. If the Attorney General determines that these facts and all other relevant data constitute substantial evidence of potential for abuse such as to warrant control \* \* \* he shall initiate proceedings for control \* \* \* under subsection (a) of this section.”

### Procedural History

Pursuant to section 811(b), in March 1996, the Drug Enforcement Administration (DEA) requested from the Department of Health and Human Services (HHS) a scientific and medical evaluation of carisoprodol, and a recommendation as to whether it should be controlled. In February 1997, however, the U.S. Food and Drug Administration’s (FDA) Drug Abuse Advisory Committee concluded that the then-available data did not support controlling carisoprodol.

Thereafter, at the direction of the National Institute on Drug Abuse (NIDA) and the College of Problems of Drug Dependence (CPDD), additional pharmacological studies of carisoprodol’s abuse liability were conducted. In the meantime, DEA gathered additional new data on actual abuse and law enforcement encounters involving the drug, as well as other information, which it sent to HHS on November 14, 2005. FDA also acquired new data from the Drug Abuse Warning Network (DAWN), the National Survey on Drug Use and Health (NSDUH), Florida Medical Examiners Commission reports, FDA’s Adverse Event Reporting System, as well as other information from a variety of sources.

On October 6, 2009, HHS concluded its review of the evidence pertaining to the eight factors set forth in 21 U.S.C. 811 and recommended that carisoprodol be placed in schedule IV. Thereafter, on November 17, 2009, DEA issued

a Notice of Proposed Rulemaking, which proposed placing carisoprodol in schedule IV. Therein, DEA invited all persons to submit written comments or objections to the proposed rule; DEA also notified “interested persons” of their right to request a hearing.

DEA received seventeen comments on the proposed rule; sixteen of the commenters (which included law enforcement officials, medical professionals, and state regulators) supported the proposed rulemaking.\1\ One entity, Meda Pharmaceuticals, Inc. (Meda), which manufactures the branded drug Soma, objected to the proposed rule on the ground that the “the administrative record does not include substantial and reliable evidence of potential for abuse sufficient to warrant scheduling carisoprodol and because the proposal gives inadequate weight to the negative impact on patient care of scheduling carisoprodol.” Meda also requested a hearing. On March 21, 2010, I granted Meda’s request and assigned the matter to the Agency’s Office of Administrative Law Judges (ALJ).

[1\ None of the commenters raised any issue as to the various Regulatory Certifications contained in the Notice of Proposed Rulemaking. See 74 FR at 59111. One commenter, which represents wholesale distributors, requested that if the proposed rule is finalized, its effective date be set at 120 days from the date of publication to provide adequate time to comply with various regulations.]

Following pre-hearing procedures, an ALJ conducted a hearing on July 6, 8, and 9, as well as on August 3-6, 2010. At the hearing, both the Government and Meda elicited the testimony of witnesses and introduced various documents into evidence. Thereafter, both the Government and Meda filed briefs containing their proposed findings of fact and conclusions of law.

[Editor’s Note: See the Federal Register for the complete ALJ’s recommended decision and ruling on the binding nature of the FDA’s scientific and medical evaluation, as well as the complete findings of fact including a detailed discussion of the eight factor evaluation considered by DEA in the scheduling decision.]

[Editor’s Note: See the Federal Register for regulatory requirements and regulatory analysis.]

#### **List of Subjects in 21 CFR Part 1308**

Administrative practice and procedure, Drug traffic control, Reporting and recordkeeping requirements. Narcotics, Prescription drugs.

Under the authority vested in the Attorney General by section 201(a) of the CSA (21 U.S.C. 811(a)), and delegated to the Administrator of the Drug Enforcement Administration pursuant to 28 CFR 0.100, 21 CFR part 1308 is amended to read as follows:

#### **PART 1308--SCHEDULES OF CONTROLLED SUBSTANCES**

1. The authority citation for part 1308 continues to read as follows:

**Authority:** 21 U.S.C. 811, 812, 871(b), unless otherwise noted.

2. Section 1308.14 is amended by redesignating paragraphs (c)(5) through (c)(52) as paragraphs (c)(6) through (c)(53) and adding a new paragraph (c)(5) to read as follows:

##### **Sec. 1308.14 Schedule IV.**

\* \* \* \* \*

(c) \* \* \*

(5) Carisoprodol .....8192

\* \* \* \* \*

Dated: November 18, 2011.

Michele M. Leonhart,  
Administrator.

[FR Doc. 2011-31542 Filed 12-9-11; 8:45 am]

BILLING CODE 4410-09-P

## **– SCHEDULING UPDATE –**

[Editor's Preface: The following notice has been edited for Microgram Bulletin. See the Federal Register: December 15, 2011 (Volume 76, Number 241) (Rules and Regulations) (Pages 77895-77899) for the complete text.]

### **DEPARTMENT OF JUSTICE**

#### **Drug Enforcement Administration**

#### **21 CFR Part 1308**

**[Docket No. DEA-354]**

#### **Schedules of Controlled Substances: Placement of Ezogabine Into Schedule V**

**AGENCY:** Drug Enforcement Administration, Department of Justice.

**ACTION:** Final rule.

**SUMMARY:** With the issuance of this final rule, the Administrator of the Drug Enforcement Administration (DEA) places the substance ezogabine, including its salts, isomers, and salts of isomers whenever the existence of such salts, isomers, and salts of isomers is possible, into Schedule V of the Controlled Substances Act (CSA).

**DATES:** Effective date: December 15, 2011.

**FOR FURTHER INFORMATION CONTACT:** Rhea D. Moore, Office of Diversion Control, Drug Enforcement Administration, 8701 Morrisette Drive, Springfield, Virginia 22152; Telephone (202) 307-7165.

#### **SUPPLEMENTARY INFORMATION:**

##### **Legal Authority**

The DEA implements and enforces Titles II and III of the Comprehensive Drug Abuse Prevention and Control Act of 1970, often referred to as the Controlled Substances Act and the Controlled Substances Import and Export Act (21 U.S.C. 801-971), as amended (hereinafter, "CSA"). The implementing regulations for these statutes are found in Title 21 of the Code of Federal Regulations (CFR), parts 1300 to 1321. Under the CSA, controlled substances are classified in one of five schedules based upon their potential for abuse, their currently accepted medical use, and the degree of dependence the substance may cause, 21 U.S.C. 812. The initial schedules of controlled substances by statute are found at 21 U.S.C. 812(c) and the current list of scheduled substances is published at 21 CFR Part 1308.

Pursuant to 21 U.S.C. 811(a)(1), the Attorney General may, by rule, "add to such a schedule or transfer between such schedules any drug or other substance if he (A) Finds that such drug or other substance has a potential for abuse, and (B) makes with respect to such drug or other substance the findings prescribed by subsection (b) of section 812 of this title for the schedule in which such drug is to be placed \* \* \*" Pursuant to 28 CFR 0.100(b), the Attorney General has delegated this scheduling authority to the Administrator of DEA.

The CSA provides that scheduling of any drug or other substance may be initiated by the Attorney General (1) On his own motion; (2) at the request of the Secretary of HHS, or (3) on the petition of any interested party, 21 U.S.C. 811(a). This action is based on a recommendation from the Assistant Secretary for Health of the Department of Health and Human Services (HHS) and on an evaluation of all other relevant data by DEA. This action imposes the regulatory controls and criminal sanctions of Schedule V on the manufacture, distribution, dispensing, importation, and exportation of ezogabine and products containing ezogabine.

Pursuant to 21 CFR 1308.44(e), the Administrator of DEA may issue her final order "[I]f all interested persons waive or are deemed to waive their opportunity for the hearing or to participate in the hearing." As no requests for a hearing were filed on this proposed scheduling action, all interested persons are deemed to have waived their

opportunity for a hearing pursuant to 21 CFR 1308.44(d), and the Administrator may issue her final order without a hearing.

Ezogabine is a new drug with a novel mechanism of action for the treatment of partial onset seizures. Because ezogabine is a new drug with possible immediate medical application to a life-threatening illness not always treatable with medications currently available and because it may not be prescribed in the United States until this final rulemaking action is in effect and the subsequent requirements that result from this final action are satisfied, the Administrator hereby finds that it is in the interest of public health to forego the 30 day period prior to this final rule taking effect. This will impose no hardship on any interested party and is responsive to comments intended to facilitate the availability of ezogabine as soon as possible for that population of people suffering from seizures that may benefit from treatment with ezogabine. Therefore, in accordance with this finding of conditions of public health and of good cause to waive the 30 day period and pursuant to 21 CFR 1308.45 and 5 U.S.C. 553(d)(3), this final rule is effective upon publication.

## **Background**

Ezogabine, known chemically as N-[2-amino-4-(4-fluorobenzylamino)-phenyl]-carbamic acid ethyl ester, is a new chemical substance with central nervous system depressant properties and is classified as a sedative-hypnotic. Pharmacological studies indicate that ezogabine primarily acts as a ligand at ion-gated channels in the brain to enhance potassium currents mediated by neuronal KCNQ (Kv7) channels. Additionally, ezogabine indirectly enhances the gamma-aminobutyric acid (GABA) mediated neurotransmission. On June 10, 2011, the Food and Drug Administration (FDA) approved a New Drug Application (NDA) for ezogabine as an adjunct treatment of partial onset seizures, to be marketed under the trade name Potiga[supreg].\1\

[1\ [http://www.accessdata.fda.gov/drugsatfda\\_docs/nda/2011/022345Orig1s000TOC.cfm](http://www.accessdata.fda.gov/drugsatfda_docs/nda/2011/022345Orig1s000TOC.cfm); as of July 21, 2011.]

## **Determination To Schedule Ezogabine**

Pursuant to 21 U.S.C. 811(a), proceedings to add a drug or substance to those controlled under the CSA may be initiated by request of the Secretary of HHS. On January 12, 2011, HHS provided DEA with a scientific and medical evaluation document prepared by FDA entitled “Basis for the Recommendation for Control of Ezogabine in Schedule V of the Controlled Substances Act.” Pursuant to 21 U.S.C. 811(b), this document contained an eight-factor analysis of the abuse potential of ezogabine as a new drug, along with HHS’ recommendation to control ezogabine under Schedule V of the CSA. In response, DEA conducted an eight-factor analysis of ezogabine’s abuse potential pursuant to 21 U.S.C. 811(c).

Following analysis, the Administrator of DEA published a Notice of Proposed Rulemaking entitled “Schedules of Controlled Substances: Placement of Ezogabine into Schedule V” on October 21, 2011 (76 FR 65424), which proposed placement of ezogabine into Schedule V of the CSA.

[Editor’s Note: See the Federal Register for a brief summary of each factor as analyzed by HHS and DEA, and as considered by DEA in the scheduling decision.]

## **Requests for a Hearing and Comments**

[Editor’s Note: See the Federal Register for comments received and DEA’s response to said comments.]

## **Scheduling Conclusion**

Based on consideration of the scientific and medical evaluation and accompanying recommendation of HHS, and based on DEA’s consideration of its own eight-factor analysis, DEA finds that these facts and all relevant data constitute substantial evidence of potential for abuse of ezogabine. As such, DEA will schedule ezogabine as a controlled substance under the CSA.

## **Determination of Appropriate Schedule**

The CSA establishes five schedules of controlled substances known as Schedules I, II, III, IV, and V. The statute outlines the findings required to place a drug or other substance in any particular schedule, 21 U.S.C. 812(b). After



consideration of the analysis and recommendation of the Assistant Secretary for Health of HHS and review of all available data, the Administrator of DEA, pursuant to 21 U.S.C. 812(b)(5), finds that:

- (1) Ezogabine has a low potential for abuse relative to the drugs or other substances in Schedule IV. The overall abuse potential of ezogabine is comparable to the Schedule V substances such as pregabalin and lacosamide;
- (2) Ezogabine has a currently accepted medical use in treatment in the United States. Ezogabine was approved for marketing by FDA as an adjunct treatment of partial onset seizures; and
- (3) Abuse of ezogabine may lead to limited physical dependence or psychological dependence relative to the drugs or other substances in Schedule IV.

Based on these findings, the Administrator of DEA concludes that ezogabine, including its salts, isomers and salts of isomers, whenever the existence of such salts, isomers, and salts of isomers is possible, warrants control in Schedule V of the CSA (21 U.S.C. 812(b)(5)).

#### **Requirements for Handling Ezogabine**

[Editor's Note: See the Federal Register for the requirements for handling ezogabine.]

#### **Regulatory Analyses**

[Editor's Note: See the Federal Register for regulatory analyses.]

#### **List of Subjects in 21 CFR Part 1308**

Administrative practice and procedure, Drug traffic control, Reporting and recordkeeping requirements.

For the reasons set out above, 21 CFR Part 1308 is amended as follows:

#### **PART 1308--SCHEDULES OF CONTROLLED SUBSTANCES**

1. The authority citation for 21 CFR Part 1308 continues to read as follows:

**Authority:** 21 U.S.C. 811, 812, 871(b), unless otherwise noted.

2. Section 1308.15 is amended by redesignating paragraphs (e)(1) and (2) as paragraphs (e)(2) and (3), and adding a new paragraph (e)(1) to read as follows:

##### **Sec. 1308.15 Schedule V.**

\* \* \* \* \*

(e) \* \* \*

(1) Ezogabine [N-[2-amino-4-(4-fluorobenzylamino)-phenyl]-carbamic acid ethyl ester]-2779

\* \* \* \* \*

Dated: December 8, 2011.

Michele M. Leonhart,  
Administrator.

[FR Doc. 2011-32172 Filed 12-14-11; 8:45 am]

BILLING CODE 4410-09-P

\* \* \* \* \*      \* \* \* \* \*      \* \* \* \* \*      \* \* \* \* \*      \* \* \* \* \*

## SELECTED REFERENCES

[The Selected References section is a compilation of recent publications of presumed interest to forensic chemists. Unless otherwise stated, all listed citations are published in English. Abbreviated mailing address information duplicates that which is provided by the abstracting service. Patents and Proceedings are reported only by their *Chemical Abstracts* citation number. For full text copies of any of the articles listed, you may email the DEA Library at [dea.library@usdoj.gov](mailto:dea.library@usdoj.gov)]

1. Bodnar W, Melissa A, McGuffin VL, Smith RW. **Forensic analysis of *Salvia divinorum* using multivariate statistical procedures. Part I: discrimination from related *Salvia* species.** *Analytical and Bioanalytical Chemistry* 2012;402(2):833-842. [Editor's Notes: Salvinorin A, the active compound in *Salvia divinorum*, was extracted from *Salvia divinorum* plant leaves with dichloromethane. Four additional *Salvia* species (*Salvia officinalis*, *Salvia guaranitica*, *Salvia splendens*, and *Salvia nemorosa*) were extracted using the same procedure. All of the extracts were analyzed by GC/MS, and differentiation of *Salvia divinorum* from the other species was accomplished using principle component analysis (PCA) and visual comparison of the total ion chromatograms. Contact: Department of Chemistry, Michigan State University, East Lansing, MI 48824, USA.]
2. Choodum A, Nic Daeid N. **Rapid and semi-quantitative presumptive tests for opiate drugs.** *Talanta* 2011;86:284-292. [Editor's Notes: Digital image analysis was applied to the products of color tests for opiates. Adobe® Photoshop® was used for color analysis to obtain analytical data in to form of a Red Green Blue (RGB) value. Calibration curves were developed for morphine, codeine, and heroin hydrochloride and the semi-quantitative results had good agreement with the GC quantification results obtained for the samples analyzed. Contact: Department of Applied Science, Faculty of Science, and Trace Analysis and Biosensor Research Center, Prince of Songkla University, Songkla, Thailand 90112.]

### Additional References of Possible Interest:

1. Bijlsma L, Sancho JV, Hernandez F, Niessen WMA. **Fragmentation pathways of drugs of abuse and their metabolites based on QTOF MS/MS and MS<sup>E</sup> accurate-mass spectra.** *Journal of Mass Spectrometry* 2011;46(9):865-875. [Editor's Notes: The fragmentation pathways of several classes of drugs of abuse (cannabinoids, ketamine, amphetamine and amphetamine-type stimulants, cocaine, and opiates) and their related substances has been studied. Accurate-mass spectra of 37 drugs of abuse and related compounds were obtained using liquid chromatography-quadrupole time-of-flight mass spectrometry, performing both MS/MS and MS<sup>E</sup> experiments. Structures of fragment ions were proposed for several drugs of abuse. Contact: Research Institute for Pesticides and Water, University Jaume I, Castellon, Spain.]
2. Meyer MR, Maurer HH. **Current status of hyphenated mass spectrometry in studies of the metabolism of drugs of abuse, including doping agents.** *Analytical and Bioanalytical Chemistry* 2012;402(1):195-208. [Editor's Notes: Presents title review. Contact: Department of Experimental and Clinical Toxicology, Institute of Experimental and Clinical Pharmacology and Toxicology, Saarland University, Homburg (Saar) 66421, Germany.]

3. Ortiz RS, Mariotti KC, Schwab NV, Sabin GP, Rocha WFC, de Castro EVR, Limberger RP, Mayorga P, Bueno MIMS, Romao W. **Fingerprinting of sildenafil citrate and tadalafil tablets in pharmaceutical formulations via X-ray fluorescence (XRF) spectrometry.** Journal of Pharmaceutical and Biomedical Analysis 2011;58:7-11. [Editor's Notes: Presents title study. Contact: Rio Grande do Sul Technical and Scientific Division, Brazilian Federal Police, Porto Alegre, RS 90160-093, Brazil.]
4. Pal R, Megharaj M, Kirkbride KP, Heinrich T, Naidu R. **Biotic and abiotic degradation of illicit drugs, their precursor, and by-products in soil.** Chemosphere 2011;85(6):1002-1009. [Editor's Notes: Presents title study. Contact: Centre for Environmental Risk Assessment and Remediation, University of South Australia, Mawson Lakes, Adelaide 5095, Australia.]
5. Tyrkkoe E, Pelander A, Ojanperae I. **Differentiation of structural isomers in a target drug database by LC/Q-TOFMS using fragmentation prediction.** Drug Testing and Analysis 2010;2(6):259-270. [Editor's Notes: Presents title study. Contact: Department of Forensic Medicine, University of Helsinki, FI-00014 Helsinki, Finland.]

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## THE DEA FY 2012 STATE AND LOCAL FORENSIC CHEMISTS SEMINAR SCHEDULE

The FY 2012 schedule for the State and Local Forensic Chemists Seminar is as follows:

March 19-23, 2012  
June 11-15, 2012  
September 10-14, 2012

The school is open only to forensic chemists working for law enforcement agencies. It is intended for chemists who have completed their agency's internal training program and have also been working on the bench for at least one year. There is no tuition charge. The course is held at the Hyatt Place Dulles North Hotel in Sterling, Virginia (near the Washington/Dulles International Airport). A copy of the application form is reproduced on the last page of this issue of *Microgram Bulletin*. Completed applications should be mailed to the Special Testing and Research Laboratory at 22624 Dulles Summit Court, Dulles, VA 20166. For additional information, email [DEA-Forensic.Chemist@usdoj.gov](mailto:DEA-Forensic.Chemist@usdoj.gov).

\* \* \* \* \*

## SCIENTIFIC MEETINGS

**Title:** AAFS 64<sup>th</sup> Annual Scientific Meeting  
**Sponsoring Organization:** American Academy of Forensic Sciences  
**Inclusive Dates:** February 20-25, 2012  
**Location:** Atlanta Marriott Marquis (Atlanta, GA)  
**Contact Information:** See website  
**Website:** [www.aafs.org](http://www.aafs.org)

## Information and Instructions for *Microgram Bulletin*

### General Information

*Microgram Bulletin* and *Microgram Bulletin LE* are monthly newsletters published by the U.S. Drug Enforcement Administration's Office of Forensic Sciences. *Microgram Bulletin* is primarily intended to provide up-to-date content of interest to the forensic community including Drug Scheduling Updates, Safety Alerts, Selective Literature References, Meeting Announcements, Employment Opportunities, The Journal and Textbook Collection Exchange, and Training Opportunities. *Microgram Bulletin LE* is primarily intended to assist and serve forensic scientists concerned with the detection and analyses of suspected controlled substances for forensic/law enforcement purposes. It also features Intelligence Alerts and Briefs, in addition to the content found in *Microgram Bulletin*.

### Access to *Microgram Bulletin* and *Microgram Bulletin LE*

*Microgram Bulletin* is posted at [www.dea.gov](http://www.dea.gov). *Microgram Bulletin LE* is posted at [www.leo.gov](http://www.leo.gov) in the DEA Special Interest Group (SIG) and the Department of Justice's information exchange website (IDEA). *Microgram Bulletin* and *Microgram Bulletin LE* are available only on the internet.

To receive *Microgram* email notifications or to change your notification preferences, please go to <https://public.govdelivery.com/accounts/USDOJDEA/subscriber/new?>, enter your email address, and follow the instructions. You will be notified by email when a new issue of *Microgram* is posted. The publications are not sent as attachments.

### Costs

Access to *Microgram Bulletin* and *Microgram Bulletin LE* is free.

### Submissions to *Microgram Bulletin* and *Microgram Bulletin LE*

*Microgram Bulletin* includes Safety Alerts, Selected Literature References, Meeting Announcements, Employment Opportunities, pertinent sections from the Code of Federal Regulations, columns of topical importance, and similar material of interest to the general forensic community. *Microgram Bulletin LE* will also feature Intelligence Alerts and Briefs, in addition to the content found in *Microgram Bulletin*. Explanatory details for most of the above types of submission are detailed below, and typical examples are published in most issues of *Microgram Bulletin* or *Microgram Bulletin LE*.

All submissions must be in English. Although *Microgram Bulletin LE* is classified as law enforcement sensitive, case sensitive information should not be submitted. All submissions should, whenever possible, be submitted electronically, as straight email or as an PC-compatible Microsoft Word® attachment, to: [DEA-Microgram@usdoj.gov](mailto:DEA-Microgram@usdoj.gov). Current versions of Microsoft Word® (defined as having release dates less than 5 years old) should be utilized. If email submission is not possible, submissions may be mailed to: DEA Headquarters; Attn: Office of Forensic Sciences/Microgram Editor; 8701 Morrisette Drive; Springfield, VA 22152. Hard copy mailings should be accompanied by an electronic version on an PC-compatible standard CD-R. **Note that diskettes should be mailed in an irradiation-proof protective sleeve, and the mailing envelope should be marked: "Warning - Contains Electronic Media - Do Not Irradiate."** Note also that mailed submissions may be subject to lengthy handling delays beyond the control of the Office of Forensic Sciences, and electronic media sent through the mail may be destroyed en route by sanitizing procedures, despite protective

measures and written warnings. All submissions should include the following **Contact Information:** The Full Name and Address of Submitting Laboratory or Office, and the Full Name, Phone Number, FAX Number, and Preferred email address of the Submitting Individual.

**Safety Alerts** are urgent communiqués to the *Microgram Bulletin* readership which give notice of a specific safety issue of particular interest to forensic or crime laboratory personnel, or to law enforcement personnel dealing with controlled substances. They should include a concise synopsis of the incident(s), recommendations (if any), pertinent literature citations (if any are known), and a mechanism for providing feedback (if appropriate).

**Selected Literature References** is a monthly compilation of reference citations of presumed interest to the *Microgram Bulletin* readership, derived from approximately 7,500 scientific periodicals. The focus of the Selected Literature References is the detection and analysis of suspected controlled substances for forensic/law enforcement purposes. References from clinical and toxicological journals are included only if the material is considered to be of high interest to forensic chemists (for example, contains the mass spectra of an unusual substance that is not known to be published elsewhere). Note that citations from obscure periodicals may be missed, and all *Microgram Bulletin* subscribers are invited to submit citations of interest if they do not appear in *Microgram Bulletin* within three months of their publication. Of particular interest are articles from regional forensic science associations that are unlikely to be noted by any abstracting service. Citations should include a summary sentence and the primary author's contact information.

**Meeting Announcements** list upcoming meetings of presumed interest to the *Microgram Bulletin* readership. In general, only meetings which are dedicated to forensic chemistry/forensic drug analysis or include a subsection so dedicated will be publicized in *Microgram Bulletin*. Meeting Announcements should include the Formal Title, Sponsoring Organization, Inclusive Dates, Location (City, State, and specific locale), Registration Deadline, Recommended Hotel (include details on special rates and deadlines where applicable), and Contact Individual's Name, Phone Number, and email Address. If available, the URL for the meeting website should also be included in the Announcement.

**Employment Opportunities** lists job announcements of presumed interest to the *Microgram Bulletin* readership. In general, only jobs with a forensic chemistry/forensic drug analysis focus for Federal, State, or Local Crime Laboratories or Offices will be publicized in *Microgram Bulletin*. Exceptions may be requested and will be considered on a case-by-case basis (for example, an academic position in a Forensic Chemistry Department). Employment Opportunity announcements should include the Formal Title of the Organization, Formal Title of the Laboratory or Office, Position Title, Laboratory or Office Location (City and State), Salary Range, Opening and Closing Dates, Duties, General Requirements, Specialized Requirements (if any), Application Procedures, and the Contact Individual's Name, Phone Number, email Address, and Mailing Address. If available, the URL for the agency's website, and (if available) the specific URL for the job posting should also be included in the Announcement. Employment Opportunities will typically be posted for 3 consecutive months, but not past the application deadline.

#### **The Journal/Textbook Collection Exchange**

If any subscriber is interested in donating any forensic or analytical chemistry journal and/or textbook collection to a fellow subscriber or library, *Microgram Bulletin* is willing to list the

offered materials and the associated contact information in a future issue. The general format should follow the example in the January 2003 issue, and should be sent via email to the *Microgram* Editor at: [DEA-Microgram@usdoj.gov](mailto:DEA-Microgram@usdoj.gov). Only items for donation (not for sale) will be considered for publication, and donations to libraries should adhere to journal restrictions and/or time limits (if any) on such offers.

**Intelligence Alerts and Briefs** (*Microgram Bulletin LE* only) are concise synopses of the physical and chemical characteristics of novel and/or interesting exhibits submitted to law enforcement laboratories involved in the detection and analyses of suspected controlled substances for forensic/law enforcement purposes. Alerts have some unusual aspect, such as a novel drug, an atypical formulation, or a new smuggling technique, whereas Briefs are reports of routine analyses (that is, that confirmed what was suspected/expected). Both Alerts and Briefs should include descriptive details adhering to (as appropriate) the following outline:

- What laboratory did the analysis? (Full Name)
- Where is the laboratory located?
- What agency seized the exhibit?
- Where was the exhibit seized?
- Were there any interesting (but non-sensitive) aspects of the seizure?
- What controlled substance was suspected upon submission?
- Detailed physical description (appearance, dimensions, logos, odor, packaging, etc.)
- Quantities (numbers of tablets, packages or bricks, average mass, total net mass, etc.)
- Photos (see additional information, below)
- What techniques were used to analyze the exhibit?
- Actual composition of the exhibit?
- Quantitation data? (if not quantitated, provide a qualitative approximation if possible)
- Adulterants and diluents? (if identified, especially if unusual)
- First seizure of this type? (if not, provide brief details of previous examples)
- Editorial comments? (if any)
- Literature references for unusual submissions? (if needed)

In order to avoid confusion, if uncommon controlled substances are identified, the description should use the full chemical name(s) of the identified substances (if desired, acronyms or street terminology (e.g., “Foxy-Methoxy”, “Nexus”, or “STP”) can be included in parentheses after the full chemical name).

Please provide photographs as attachments and not as images embedded in documents. JPEG images are preferred. Photographs should be of reasonable size. Unless the scale is obvious, photographs of subject exhibit(s) should include either a metric ruled scale or a coin or bill (U.S. currency) to place the exhibit’s size in context.

**Selected Intelligence Briefs** (*Microgram Bulletin LE* only) are reprinted (with permission) unclassified intelligence briefs of presumed interest to the *Microgram Bulletin LE* readership that have been previously published in restricted or nonrestricted publications or websites that are also dedicated to the detection and analyses of suspected controlled substances for forensic/law enforcement purposes. Selected Intelligence Briefs must be unclassified, and should be a minimum of 1 page and a maximum of 10 pages in length (single spaced at 12 point Times New Roman font, including photos, tables, charts, etc.). All *Microgram Bulletin LE* subscribers



are invited to submit such material, which must include the author's and publisher's contact information.

### **Requests for *Microgram* and/or *Microgram Bulletin* Archives, 1967 - 2002**

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However, the entire collection, individual issues, or individual sections of issues (e.g., specific articles) are available to law enforcement affiliated offices and laboratories. Requests from such offices and laboratories must be made on official letterhead and mailed to:

DEA Headquarters  
Attn: Office of Forensic Sciences/*Microgram* Editor  
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Springfield, VA 22152.

Note that requests made via email will not be honored.

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- 2) Due to the ease of scanning, copying, electronic manipulating, and/or reprinting, only the posted copies of *Microgram Bulletin* and *Microgram Bulletin LE* at [www.leo.gov](http://www.leo.gov), the Department of Justice's information exchange website (IDEA), and [www.dea.gov](http://www.dea.gov) are valid. All other copies, whether electronic or hard, are suspect unless verified against the posted versions.
- 3) **WARNING!:** Due to the often lengthy time delays between the actual dates of seizures and their subsequent reporting in *Microgram Bulletin* and/or *Microgram Bulletin LE*, and also because of the often wide variety of seizure types with superficially similar physical attributes, published material cannot be utilized to visually identify controlled substances currently circulating in clandestine markets. **The United States Department of Justice and the Drug Enforcement Administration assume no liability for the use or misuse of the information published in *Microgram Bulletin* and *Microgram Bulletin LE*.**

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Email Address:			
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College or University	Degree	Major	
Please Check Which Techniques or Equipment Are Used in Your Laboratory			
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<input type="checkbox"/>	Column Chromatography	<input type="checkbox"/>	IR
<input type="checkbox"/>	Microcrystal Tests	<input type="checkbox"/>	CE
<input type="checkbox"/>	Thin Layer Chromatography	<input type="checkbox"/>	GC/MS
<input type="checkbox"/>	GC	<input type="checkbox"/>	Other (please specify)
<input type="checkbox"/>	HPLC	<input type="checkbox"/>	Other (please specify)
Indicate Analytical Problem(s) Nominee Would Like to Have Covered:			
Choice of Seminar Dates:			
1st Choice:		2nd Choice:	
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The U.S. Attorney General has determined that the publication of this periodical is necessary in the transaction of the public business required by the Department of Justice. Information, instruction, and disclaimers are published in the January issues.

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– FEBRUARY 2012 –

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### SELECTED REFERENCES

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1. Awad T, Maher HM, DeRuiter J, Clark CR. **GC-MS and GC-IRD studies on the ring isomers of N-methyl-2-methoxyphenyl-3-butanamines (MPBA) related to 3,4-MDMA.** *Journal of Chromatographic Science* 2011;49(5):345-352. [Editor's Notes: Presents title study. Contact: Department of Pharmacal Sciences, Harrison School of Pharmacy, Auburn University, Auburn, AL 36832, USA.]
2. Giebink PJ, Smith RW. **Development of microwave-assisted extraction procedure for organic impurity profiling of seized 3,4-methylenedioxymethamphetamine (MDMA).** *Journal of Forensic Sciences* 2011;56(6):1483-1492. [Editor's Notes: Presents title study. Contact: Forensics Science Program, School of Criminal Justice, Michigan State University, East Lansing, MI 48824, USA.]
3. Lurie IS, Li L, Toske SG. **Hydrophilic interaction chromatography of seized drugs and related compounds with sub 2  $\mu$ m particle columns.** *Journal of Chromatography, A* 2011;1218(52):9336-9344. [Editor's Notes: The use of hydrophilic interaction chromatography (HILIC) with sub 2  $\mu$ m particle columns for the analysis of drugs and related compounds of forensic interest is described. This technique uses a high organic/low aqueous buffered mobile phase with a polar

stationary phase, and is excellent for the separation of many of the charged solutes that are found in forensic drug exhibits. In this study, HILIC is investigated for 11 solutes of forensic interest. In addition, for columns containing either ethylene bridged hybrid particles with or without an amide bonded phase, the effects of acetonitrile concentration, buffer type, buffer concentration, linear velocity, and sample concentration were studied. Based on these studies, HILIC with sub 2  $\mu\text{m}$  particle columns can offer highly efficient, selective, and rapid isocratic separations of drugs and related compounds of forensic interest, with excellent peak shapes and low back pressures. This is in contrast to reverse phase chromatography (RPLC), where gradient elution is usually required, which can result in extensive overlap between acidic, neutral, and basic solutes. In addition, since HILIC exhibits a much greater loading capacity than RPLC, it could be a preferred technique for drug profiling. Furthermore, because high organic content mobile phases are highly amenable to mass spectrometric detection, the use of HILIC with tandem mass spectrometric detection for the analysis of seized drugs is described. Contact: Special Testing and Research Laboratory, U.S. Drug Enforcement Administration, Dulles, VA 20166, USA.]

4. Stewart SP, Bell SEJ, Fletcher NC, Bouazzaoui S, Ho YC, Speers SJ, Peters KL. **Raman spectroscopy for forensic examination of beta-ketophenethylamine “legal highs”: Reference and seized samples of cathinone derivatives.** *Analytica Chimica Acta* 2011;711:1-6. [Editor’s Notes: Presents title study. Contact: Innovative Molecular Materials Group, School of Chemistry and Chemical Engineering, Queen's University, Belfast BT9 5AG, United Kingdom.]
5. Willard MAB, McGuffin VL, Smith RW. **Forensic analysis of *Salvia divinorum* using multivariate statistical procedures. Part II: Association of adulterated samples to *S. divinorum*.** *Analytical and Bioanalytical Chemistry* 2012;402(2):843-850. [Editor’s Notes: In this study, *Salvia divinorum* was extracted and spiked onto four different plant materials (*S. divinorum*, *Salvia officinalis*, *Cannabis sativa*, and *Nicotiana tabacum*) to simulate an adulterated sample that might be encountered in a forensic laboratory. The adulterated samples were extracted and analyzed by GC/MS, and the resulting total ion chromatograms were subjected to a series of pretreatment procedures that were used to minimize non-chemical sources of variance in the data set. The data was then analyzed using principal components analysis (PCA) to investigate association of the adulterated extracts to unadulterated *S. divinorum*. While association was possible based on visual assessment of the PCA scores plot, additional procedures including Euclidean distance measurement, hierarchical cluster analysis, Student's *t* tests, Wilcoxon rank-sum tests, and Pearson product moment correlation were also applied to the PCA scores to provide a statistical evaluation of the observed association. The advantages and limitations of each statistical procedure were compared in a forensic context. Contact: Department of Chemistry, Michigan State University, East Lansing, MI 48824, USA.]

### Additional References of Possible Interest:

1. Elian AA, Hackett J. **Anion exchange SPE and liquid chromatography-tandem mass spectrometry in GHB analysis.** Journal of Chromatography, B: Analytical Technologies in the Biomedical and Life Sciences 2011;879(31):3752-3758. [Editor's Notes: Presents title study. Contact: Massachussetts State Police Crime Laboratory, Sudbury, MA 01776, USA.]
2. Mandrioli R, Mercolini L, Raggi MA. **Chiral analysis of amphetamines, methadone and metabolites in biological samples by electrodriven methods.** Electrophoresis 2011;32(19):2629-2639. [Editor's Notes: Presents title review. Contact: Laboratory of Pharmaco-Toxicological Analysis, Faculty of Pharmacy, Department of Pharmaceutical Sciences, Alma Mater Studiorum, University of Bologna, Bologna, Italy.]
3. Pascali JP, Bortolotti F, Tagliaro F. **Recent advances in the application of CE to forensic sciences, an update over years 2009-2011.** Electrophoresis 2012;33(1):117-126. [Editor's Notes: Presents title review. Contact: Department of Public Health and Community Medicine, Section of Forensic Medicine, University of Verona, Verona, Italy.]
4. Walpurgis K, Thomas A, Laussmann T, Horta L, Metzger S, Schaenzer W, Thevis M. **Identification of fibroblast growth factor 1 (FGF-1) in a black market product.** Drug Testing and Analysis 2011;3(11-12):791-797. [Editor's Notes: Presents title study. Contact: German Sport University Cologne, Centre for Preventive Doping Research/Institute of Biochemistry, Germany.]
5. Wang B, He J, Shamsi SA. **A high-throughput multivariate optimization for the simultaneous enantioseparation and detection of barbiturates in micellar electrokinetic chromatography-mass spectrometry.** Journal of Chromatographic Science 2010;48(7):572-583. [Editor's Notes: In this study, a micellar electrokinetic chromatography-mass spectrometry (MEKC-MS) method for the simultaneous analysis of three chiral barbiturates (mephobarbital, pentobarbital, and secobarbital) is developed using the polymeric chiral surfactant polysodium N-undecenoxy carbonyl-L-isoleucinate (poly-L-SUCIL). Contact: Department of Chemistry, Center of Biotechnology and Drug Design, Georgia State University, Atlanta, GA 30303, USA.]

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4. BNDD Bulletin, Issue 1 (April, 1969) – original or a good photocopy.

If you can assist, please contact Dr. Bob Klein at: [robert.x.klein@usdoj.gov](mailto:robert.x.klein@usdoj.gov).

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### SCIENTIFIC MEETINGS

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**Sponsoring Organization:** Mid-Atlantic Association Forensic Scientists  
**Inclusive Dates:** May 14-18, 2012  
**Location:** Turf Valley Resort (Ellicott City, MD)  
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**Location:** Boston Marriott Copley Place – Back Bay, (Boston, MA)  
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Email Address:			
Education			
College or University	Degree	Major	
Please Check Which Techniques or Equipment Are Used in Your Laboratory			
<input type="checkbox"/>	Color Tests	<input type="checkbox"/>	UV
<input type="checkbox"/>	Column Chromatography	<input type="checkbox"/>	IR
<input type="checkbox"/>	Microcrystal Tests	<input type="checkbox"/>	CE
<input type="checkbox"/>	Thin Layer Chromatography	<input type="checkbox"/>	GC/MS
<input type="checkbox"/>	GC	<input type="checkbox"/>	Other (please specify)
<input type="checkbox"/>	HPLC	<input type="checkbox"/>	Other (please specify)
Indicate Analytical Problem(s) Nominee Would Like to Have Covered:			
Choice of Seminar Dates:			
1st Choice:		2nd Choice:	
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– MARCH 2012 –

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1. Brandt SD, Tearavarich R, Dempster N, Cozzi NV, Daley PF. **Synthesis and characterization of 5-methoxy-2-methyl-N,N-dialkylated tryptamines.** Drug Testing and Analysis 2012;4(1):24-32. [Editor's Notes: This study provides  $^1\text{H}$  and  $^{13}\text{C}$  NMR, gas chromatography-electron ionization ion-trap mass spectrometry (GC-EI-IT-MS) and chemical ionization-ion-trap tandem mass spectrometry (CI-IT-MS/MS) data for 13 5-methoxy-2-methyl-N,N-dialkyltryptamines. Contact: Liverpool John Moores University, School of Pharmacy and Biomolecular Sciences, Liverpool, United Kingdom.]
2. Ehleringer JR, Casale JF, Barnette JE, Xu X, Lott MJ, Hurley J.  **$^{14}\text{C}$  analyses quantify time lag between coca leaf harvest and street-level seizure of cocaine.** Forensic Science International 2012;214(1-3):7-12. [Editor's Notes: Measurements were made on the natural abundance  $^{14}\text{C}$  content ( $\Delta^{14}\text{C}$ ) of cocaine specimens seized between 2003 and 2009. The objective of this study was to determine the extent to which  $\Delta^{14}\text{C}$  analyses could quantify the "age" of recent cocaine seizures. Here, "age" of a seized cocaine specimen is defined as the time period between when a coca leaf was harvested in South America and its seizure as cocaine at either the international or domestic street

levels. Based on  $\Delta^{14}\text{C}$  analyses of seizure specimens, there were no statistically significant differences in the ages of domestic cocaine hydrochloride and cocaine base specimens seized on the streets in different locations across the United States. Between 2007 and 2009, the average age of a street-level cocaine seizure in the United States was  $24.6 \pm 1.1$  months. Cocaine shipment seizures that were in excess of 150 kg during this time period had an average age of  $18.2 \pm 1.4$  months, whereas smaller shipment seizures were significantly older with an average age of  $22.3 \pm 0.6$  months. Analyses of the largest cocaine shipment seizures suggested that these seizures were composed of specimens with different ages, possibly representing accumulations over as much as a 31-month period. Contact: Department of Biology, University of Utah, Salt Lake City, UT 84112, USA.]

3. Gottardo R, Chiarini A, Dal Pra I, Seri C, Rimondo C, Serpelloni G, Armato U, Tagliaro F. **Direct screening of herbal blends for new synthetic cannabinoids by MALDI-TOF MS.** Journal of Mass Spectrometry 2012;47(1):141-146. [Editor's Notes: Twenty-one synthetic cathinones were successfully identified using a matrix-assisted laser desorption ionization-time of flight mass spectrometry (MALDI-TOF MS) method. The MALDI-TOF MS results were confirmed by GC/MS. Contact: University of Verona, Department of Public Health and Community Medicine, Unit of Forensic Medicine, Verona 37134, Italy.]
4. Jankovics P, Varadi A, Toelgyesi L, Lohner S, Nemeth-Palotas J, Balla J. **Detection and identification of the new potential synthetic cannabinoids 1-pentyl-3-(2-iodobenzoyl)indole and 1-pentyl-3-(1-adamantoyl)indole in seized bulk powders in Hungary.** Forensic Science International 2012;214(1-3):27-32. [Editor's Notes: Presents title study. Contact: Zrinyi u. 3, National Institute of Pharmacy, PO Box 450, Budapest H-1051, Hungary.]

#### Additional References of Possible Interest:

1. Deconinck E, Verlinde K, Courselle P, De Beer JO. **A validated ultra high pressure liquid chromatographic method for the characterization of confiscated illegal slimming products containing anorexics.** Journal of Pharmaceutical and Biomedical Analysis 2012;59:38-43. [Editor's Notes: A validated UHPLC-DAD method for the identification and quantification of pharmaceutical preparations containing sibutramine, modafinil, ephedrine, nor-ephedrine, metformin, theophylline, caffeine, diethylpropion, and orlistat is presented. Contact: Division of food, Medicines and Consumer Safety, Section Medicinal Products, Scientific Institute of Public Health (IPH), B-1050 Brussels, Belgium.]
2. Elie L, Baron M, Croxton R, Elie M. **Microcrystalline identification of selected designer drugs.** Forensic Science International 2012;214(1-3):182-188. [Editor's Notes: A microcrystalline test for the detection of 5,6-methylenedioxy-2-aminoindane (MDAI), 4-methylmethcathinone (mephedrone), and benzylpiperazine (BZP) using aqueous solutions of mercury chloride is described. Contact: University of Lincoln, School of Natural and Applied Sciences, Lincoln, United Kingdom.]

3. Elie MP, Baron MG, Birkett JW. **Injection port silylation of  $\gamma$ -hydroxybutyrate and trans-hydroxycrotonic acid: Conditions optimization and characterization of the di-tert-butyldimethylsilyl derivatives by GC-MS.** *Analyst* 2012;137(1):255-262. [Editor's Notes: Presents title study. Contact: School of Life Science, University of Lincoln, Lincoln, United Kingdom.]
4. Thevis M, Kuuranne T, Geyer H, Schaenzer W. **Annual banned-substance review: Analytical approaches in human sports drug testing.** *Drug Testing and Analysis* 2012;4(1):2-16. [Editor's Notes: Presents title review. Contact: German Sport University Cologne, Center for Preventive Doping Research - Institute of Biochemistry, Germany.]

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Education			
College or University	Degree	Major	
Please Check Which Techniques or Equipment Are Used in Your Laboratory			
<input type="checkbox"/>	Color Tests	<input type="checkbox"/>	UV
<input type="checkbox"/>	Column Chromatography	<input type="checkbox"/>	IR
<input type="checkbox"/>	Microcrystal Tests	<input type="checkbox"/>	CE
<input type="checkbox"/>	Thin Layer Chromatography	<input type="checkbox"/>	GC/MS
<input type="checkbox"/>	GC	<input type="checkbox"/>	Other (please specify)
<input type="checkbox"/>	HPLC	<input type="checkbox"/>	Other (please specify)
Indicate Analytical Problem(s) Nominee Would Like to Have Covered:			
Choice of Seminar Dates:			
1st Choice:		2nd Choice:	
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– APRIL 2012 –

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1. Kneisel S, Westphal F, Bisel P, Brecht V, Broecker S, Auwaerter V. **Identification and structural characterization of the synthetic cannabinoid 3-(1-adamantoyl)-1-pentylindole as an additive in herbal incense.** *Journal of Mass Spectrometry* 2012; 47(2):195-200. [Editor's Notes: Presents title study. Contact: University Medical Center Freiburg, Institute of Forensic Medicine, Department of Forensic Toxicology, Freiburg 79104, Germany.]
2. Nakajima J, Takahashi M, Seto T, Yoshida M, Kanai C, Suzuki J, Hamano T. **Identification and quantitation of two new naphthoylindole drugs-of-abuse, (1-(5-hydroxypentyl)-1H-indol-3-yl)(naphthalen-1-yl)methanone (AM-2202) and (1-(4-pentenyl)-1H-indol-3-yl)(naphthalen-1-yl)methanone, with other synthetic cannabinoids in unregulated "herbal" products circulated in the Tokyo area.** *Forensic Toxicology* 2012;30(1):33-44. [Editor's Notes: Presents title study. Contact: Tokyo Metropolitan Institute of Public Health 3-24-1 Hyakunin-cho, Shinjuku-ku, Tokyo 169-0073, Japan.]



3. Westphal F, Soennichsen FD, Thiemt S. **Identification of 1-butyl-3-(1-(4-methyl)naphthoyl)indole in a herbal mixture.** Forensic Science International 2012; 215(1-3):8-13. [Editor's Notes: Presents title study. Contact: Section Narcotics/ Toxicology, State Bureau of Criminal Investigation Schleswig-Holstein, Kiel 24116, Germany.]

#### Additional References of Possible Interest:

1. Melucci D, Monti D, D'Elia M, Luciano G. **Rapid in situ repeatable analysis of drugs in powder form using reflectance near-infrared spectroscopy and multivariate calibration.** Journal of Forensic Sciences 2012;57(1):86-92. [Editor's Notes: Presents title study. Contact: Department of Chemistry Giacomo Ciamician, University of Bologna, Bologna I-40126, Italy.]
2. Roehrich J, Becker J, Kaufmann T, Zoerntlein S, Urban R. **Detection of the synthetic drug 4-fluoroamphetamine (4-FA) in serum and urine.** Forensic Science International 2012;215(1-3):3-7. [Editor's Notes: Presents title study. Contact: Institute of Legal Medicine, Johannes Gutenberg-University Mainz, Am Pulverturm 3, Mainz 55131, Germany.]
3. van Nuijs ALN, Maudens KE, Lambert WE, Van Calenbergh S, Risseuw MDP, Van Hee P, Covaci A, Neels H. **Dancing on coke: Smuggling cocaine dispersed in polyvinyl alcohol.** Journal of Forensic Sciences 2012;57(1):234-238. [Editor's Notes: A report of the analysis a dance mat filled with polyvinyl alcohol containing 18% cocaine. Contact: Toxicological Centre, University of Antwerp, Antwerp 2610, Belgium.]
4. Zuba D. **Identification of cathinones and other active components of 'legal highs' by mass spectrometric methods.** Trends in Analytical Chemistry 2012;32:15-30. [Editor's Notes: Presents title study. Contact: Institute of Forensic Research, Department of Forensic Toxicology, Westerplatte 9, Krakow 31033, Poland.]

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The school is open only to forensic chemists working for law enforcement agencies. It is intended for chemists who have completed their agency's internal training program and have also been working on the bench for at least one year. There is no tuition charge. The course is held at the Hyatt Place Dulles North Hotel in Sterling, Virginia (near the Washington/Dulles International Airport). A copy of the application form is reproduced on the last page of this issue of *Microgram Bulletin*. Completed applications should be mailed to the Special Testing and Research Laboratory at 22624 Dulles Summit Court, Dulles, VA 20166. For additional information, email [DEA-Forensic-Chemist.Seminar@usdoj.gov](mailto:DEA-Forensic-Chemist.Seminar@usdoj.gov).

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### SCIENTIFIC MEETINGS

**Title:** Society of Forensic Toxicologists 42<sup>nd</sup> Annual Meeting  
**Sponsoring Organization:** Society of Forensic Toxicologists Inc.  
**Inclusive Dates:** July 1-6, 2012  
**Location:** Boston Marriott Copley Place – Back Bay (Boston, MA)  
**Contact Information:** See website  
**Website:** [www.soft2012.org](http://www.soft2012.org)

**Title:** The 41<sup>st</sup> Annual MAFS Meeting  
**Sponsoring Organization:** Midwestern Association of Forensic Scientists  
**Inclusive Dates:** September 24-28, 2012  
**Location:** Hilton Milwaukee City Center (Milwaukee, WI)  
**Contact Information:** See website  
**Website:** [www.mafs.net](http://www.mafs.net)

**Title:** Southern Association of Forensic Scientists 2012 Annual Meeting  
**Sponsoring Organization:** Southern Association of Forensic Scientists  
**Inclusive Dates:** September 30 – October 4, 2012  
**Location:** Hilton Pensacola Beach Gulf Front (Pensacola Beach, FL)  
**Contact Information:** See website  
**Website:** [www.southernforensic.org](http://www.southernforensic.org)

<b>DEA State and Local Forensic Chemist Seminar Application</b>			
Name: (PRINT NAME EXACTLY AS IT IS TO APPEAR ON CERTIFICATE)		Title:	
Employer:			
Your Office Mailing Address (include city, state, and zip code):			Length of Service:
Business Telephone: (     )     -	Business Fax: (     )     -	Date of Application:	
Email Address:			
Education			
College or University	Degree	Major	
Please Check Which Techniques or Equipment Are Used in Your Laboratory			
<input type="checkbox"/>	Color Tests	<input type="checkbox"/>	UV
<input type="checkbox"/>	Column Chromatography	<input type="checkbox"/>	IR
<input type="checkbox"/>	Microcrystal Tests	<input type="checkbox"/>	CE
<input type="checkbox"/>	Thin Layer Chromatography	<input type="checkbox"/>	GC/MS
<input type="checkbox"/>	GC	<input type="checkbox"/>	Other (please specify)
<input type="checkbox"/>	HPLC	<input type="checkbox"/>	Other (please specify)
Indicate Analytical Problem(s) Nominee Would Like to Have Covered:			
Choice of Seminar Dates:			
1st Choice:		2nd Choice:	
Laboratory Chief/Director:			
Printed Name: _____		Signature: _____	
Title: _____		Date: _____	
Phone: _____			



*The U.S. Attorney General has determined that the publication of this periodical is necessary in the transaction of the public business required by the Department of Justice. Information, instruction, and disclaimers are published in the January issues.*

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– MAY 2012 –

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### SELECTED REFERENCES

[The Selected References section is a compilation of recent publications of presumed interest to forensic chemists. Unless otherwise stated, all listed citations are published in English. Abbreviated mailing address information duplicates that which is provided by the abstracting service. Patents and Proceedings are reported only by their *Chemical Abstracts* citation number. For full text copies of any of the articles listed, you may email the DEA Library at [dea.library@usdoj.gov](mailto:dea.library@usdoj.gov).]

1. Blachut D, Wojtasiewicz K, Krawczyk K, Maurin J, Szawkalo J, Czarnocki Z. **Identification and synthesis of by-products found in 4-methylthioamphetamine (4-MTA) produced by the Leuckart method.** [Editor's Notes: Presents title study. Contact: Internal Security Agency, Forensic Laboratory, 1 Sierpnia 30A, Warsaw 02-134, Poland.]
2. Casale JF, Colley VL, LeGatt DF. **Determination of phenyltetrahydroimidazothiazole enantiomers (levamisole/dexamisole) in illicit cocaine seizures and in the urine of cocaine abusers via chiral capillary gas chromatography-flame-ionization detection: Clinical and forensic perspectives.** *Journal of Analytical Toxicology* 2012;36(2):130-135. [Editor's Notes: Illicit cocaine laboratories in South America have been adding phenyltetrahydroimidazothiazole enantiomers (levamisole and/or tetramisole) to refined illicit cocaine for over 8 years. A chiral capillary gas chromatographic methodology is presented for phenyltetrahydroimidazothiazole enantiomer determination in illicit cocaine samples and in the urine of cocaine abusers. Contact: Drug Enforcement Administration, Special Testing and Research Laboratory, 22624 Dulles Summit Court, Dulles, VA 20166, USA.]

3. Kavanagh P, O'Brien J, Fox J, O'Donnell C, Christie R, Power JD, McDermott SD. **The analysis of substituted cathinones. Part 3. Synthesis and characterisation of 2,3-methylenedioxy substituted cathinones.** Forensic Science International 2012;216(1-3):19-28. [Editor's Notes: The synthesis of the 2,3-isomers of MDPV, butylone, and methylone is reported. The isomers were characterized by  $^1\text{H}$  and  $^{13}\text{C}$  NMR spectroscopy and compared to the corresponding 3,4-isomers. A GC method is described which separates the 3,4- and the 2,3-isomers from each other. IR spectra of the 2,3-isomers are also compared with the corresponding 3,4-isomers. Contact: Department of Pharmacology and Therapeutics, School of Medicine, Trinity Centre for Health Science, St. James Hospital, Dublin 8, Ireland.]
4. Reitzel LA, Dalsgaard PW, Mueller IB, Cornett C. **Identification of ten new designer drugs by GC-MS, UPLC-QTOF-MS, and NMR as part of a police investigation of a Danish Internet company.** Drug Testing and Analysis 2012;4(5):342-354. [Editor's Notes: The identification of p-fluoroamphetamine, mephedrone (4-methylmethcathinone), flephedrone (4-fluoromethcathinone), PPP ( $\alpha$ -pyrrolidinopropiophenone), MDPV (3,4-methylenedioxypropylone), bk-MBDB (2-methylamino-1-(3,4-methylenedioxyphenyl)butan-1-one), pFBT (3-(p-fluorobenzoyl)-tropine), and JWH-073 (1-butyl-3-(1-naphthoyl)indole), methylone (3,4-methylenedioxymethcathinone), and N-ethylcathinone by GC/MS, UPLC-QTOF-MS, and NMR is presented. EI-MS spectra and the proposed main fragmentation patterns are presented, as well as, QTOF-MS exact masses and fragments, and NMR chemical shifts. For the  $\beta$ -ketophenylethylamines (mephedrone, flephedrone, PPP, MDPV, Bk-MBDB, methylone, and N-ethylcathinone) some general fragmentation patterns observed in the EI-MS and QTOF-MS spectra are further discussed and compared to other  $\beta$ -ketophenylethylamines. Contact: University of Copenhagen, Department of Forensic Medicine, Copenhagen, Denmark.]
5. Uchiyama N, Kikura-Hanajiri R, Goda Y. **Identification of a novel cannabimimetic phenylacetylindole, cannabipiperidiethanone, as a designer drug in a herbal product and its affinity for cannabinoid CB<sub>1</sub> and CB<sub>2</sub> receptors.** Chemical & Pharmaceutical Bulletin 2011;59(9):1203-1205. [Editor's Notes: A new cannabimimetic phenylacetylindole (cannabipiperidiethanone, **1**) was found as an adulterant in a herbal product which contains 2 other known synthetic cannabinoids, JWH-122 and JWH-081. The identification was based on analyses using GC/MS, LC/MS, high-resolution MS, and NMR. Accurate mass spectrum measurement showed the protonated molecular ion peak of **1** at  $m/z$  377.2233  $[\text{M}+\text{H}]^+$  and the molecular formula of **1** was  $\text{C}_{24}\text{H}_{29}\text{N}_2\text{O}_2$ . Both MS and NMR data revealed that **1** was 2-(2-methoxyphenyl)-1-{1-[(1-methylpiperidin-2-yl)-methyl]-1H-indol-3-yl}ethanone. Contact: National Institute of Health Sciences, Setagaya-ku, Tokyo, Japan.]

#### Additional References of Possible Interest:

1. Ferris TJ, Went MJ. **Synthesis, characterisation and detection of  $\gamma$ -hydroxybutyrate salts.** Forensic Science International 2012;216(1-3):158-162. [Editor's Notes: Presents title study. Contact: School of Physical Sciences, University of Kent, Canterbury, Kent CT2 7NH, United Kingdom.]

2. Grigoryev A, Kavanagh P, Melnik A. **The detection of the urinary metabolites of 3-[(adamantan-1-yl)carbonyl]-1-pentylindole (AB-001), a novel cannabimimetic, by gas chromatography-mass spectrometry.** Drug Testing and Analysis 2012;4(6):519-524. [Editor's Notes: Presents title study. Contact: Bureau of Forensic-Medical Expertise, Forensic-Chemical Division, Belgorod, Russia.]
  
3. Gottardo R, Miksik I, Aturki Z, Sorio D, Seri C, Fanali S, Tagliaro F. **Analysis of drugs of forensic interest with capillary zone electrophoresis/time-of-flight mass spectrometry based on the use of non-volatile buffers.** Electrophoresis 2012;33(4):599-606. [Editor's Notes: Presents title study. Contact: Department of Public Health and Community Medicine, Unit of Forensic Medicine, University of Verona, Verona, Italy.]
  
4. Heaton J, Gray N, Cowan DA, Plumb RS, Legido-Quigley C, Smith NW. **Comparison of reversed-phase and hydrophilic interaction liquid chromatography for the separation of ephedrine.** Journal of Chromatography, A 2012;1228:329-337. [Editor's Notes: Presents title study. Contact: Analytical and Environmental Sciences, School of Biomedical Sciences, King's College, London, United Kingdom.]
  
5. Licsandru A, Nacea V, Boscencu R. **Microwave assisted digestion of heroin street samples for trace metals analysis by inductively coupled plasma mass spectrometry.** Revista de Chimie 2012;63(1):86-91. [Editor's Notes: Presents title study. Contact: Central Laboratory for Drug Analysis and Profiling, General Inspectorate of Romanian Police, Bucharest 020123, Romania.]
  
6. Mantim T, Nacapricha D, Wilairat P, Hauser PC. **Enantiomeric separation of some common controlled stimulants by capillary electrophoresis with contactless conductivity detection.** Electrophoresis 2012;33(2):388-394. [Editor's Notes: Presents title study. Contact: Flow Innovation-Research for Science and Technology Laboratories (First Labs), Mahidol University, Bangkok, Thailand.]
  
7. Pal R, Megharaj M, Kirkbride KP, Naidu R. **Fate of 1-(1',4'-cyclohexadienyl)-2-methylaminopropane (CMP) in soil: Route-specific by-product in the clandestine manufacture of methamphetamine.** Science of the Total Environment 2012;416:394-399. [Editor's Notes: Presents title study. Contact: Centre for Environmental Risk Assessment and Remediation, University of South Australia, Adelaide, 5095 Australia.]
  
8. Peters FT, Martinez-Ramirez JA. **Analytical toxicology of emerging drugs of abuse.** Therapeutic Drug Monitoring 2010;32(5):532-539. [Editor's Notes: Presents a review of the analysis of piperazines, phenethylamines, 4-substituted amphetamines,  $\beta$ -keto-amphetamine, 2,5-dimethoxyamphetamines, pyrrolidinophenones, and synthetic cannabinoids. Contact: Institute of Forensic Medicine, University Hospital Jena, Jena, Germany.]
  
9. Sabino BD, Romeo W, Sodre ML, Correa DN, Pinto DBR, Alonso FOM, Eberlin MN. **Analysis of cocaine and crack cocaine via thin layer chromatography coupled to easy ambient sonic-spray ionization mass spectrometry.** American Journal of Analytical Chemistry 2011;2(6):658-664. [Editor's Note: Presents title study. Contact: Institute of Criminalistic Carlos Eboli, Rio de Janeiro, Brazil.]



10. Tsujikawa K, Mikuma T, Kuwayama K, Miyaguchi H, Kanamori T, Iwata YT, Inoue H. **Degradation pathways of 4-methylmethcathinone in alkaline solution and stability of methcathinone analogs in various pH solutions.** Forensic Science International 2012;220(1-3):103-110. [Editor's Notes: Analogs of methcathinone (MC), a psychoactive stimulant, are in circulation all over the world. These analogs have been assumed to be unstable in alkaline solutions, as is MC itself. The aims of this study were: (i) to identify the degradation products of 4-methylmethcathinone (4-MMC), a typical MC analog, in a solution at pH 12 and to determine the degradation pathway, (ii) to investigate the effects of antioxidants such as l-ascorbic acid and sodium sulfite on the degradation of 4-MMC, and (iii) to investigate the stability of seven MC analogs (4-MMC, 4-, 3-, or 2-fluoromethcathinone, 4-methoxymethcathinone, N-ethylcathinone, and N,N-dimethylcathinone) in solutions at different pHs. Contact: National Research Institute of Police Science, Kashiwa, Chiba 277-0882, Japan.]

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## THE DEA STATE AND LOCAL FORENSIC CHEMISTS SEMINAR SCHEDULE

The schedule for the DEA State and Local Forensic Chemists Seminar is as follows:

September 10 - 14, 2012  
November 5 - 9, 2012  
March 11 - 15, 2013  
June 10 - 14, 2013  
September 16 - 20, 2013  
November 4 - 8, 2013

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\* \* \* \* \*

## SCIENTIFIC MEETINGS

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**Sponsoring Organization:** Midwestern Association of Forensic Scientists  
**Inclusive Dates:** September 24 - 28, 2012  
**Location:** Hilton Milwaukee City Center (Milwaukee, WI)  
**Contact Information:** See website  
**Website:** [www.mafs.net](http://www.mafs.net)

**Title:** Southern Association of Forensic Scientists 2012 Annual Meeting

**Sponsoring Organization:** Southern Association of Forensic Scientists

**Inclusive Dates:** September 30 - October 4, 2012

**Location:** Hilton Pensacola Beach Gulf Front (Pensacola Beach, FL)

**Contact Information:** See website

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<b>DEA State and Local Forensic Chemist Seminar Application</b>			
Name: (PRINT NAME EXACTLY AS IT IS TO APPEAR ON CERTIFICATE)		Title:	
Employer:			
Your Office Mailing Address (include city, state, and zip code):			Length of Service:
Business Telephone: (     )     -	Business Fax: (     )     -	Date of Application:	
Email Address:			
Education			
College or University	Degree	Major	
Please Check Which Techniques or Equipment Are Used in Your Laboratory			
<input type="checkbox"/>	Color Tests	<input type="checkbox"/>	UV
<input type="checkbox"/>	Column Chromatography	<input type="checkbox"/>	IR
<input type="checkbox"/>	Microcrystal Tests	<input type="checkbox"/>	CE
<input type="checkbox"/>	Thin Layer Chromatography	<input type="checkbox"/>	GC/MS
<input type="checkbox"/>	GC	<input type="checkbox"/>	Other (please specify)
<input type="checkbox"/>	HPLC	<input type="checkbox"/>	Other (please specify)
Indicate Analytical Problem(s) Nominee Would Like to Have Covered:			
Choice of Seminar Dates:			
1st Choice:		2nd Choice:	
Laboratory Chief/Director:			
Printed Name: _____		Signature: _____	
Title: _____		Date: _____	
Phone: _____			



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– JUNE 2012 –

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1. Blachut D, Szawkalo J, Czarnocki Z. **Identification of common impurities present in the synthetic routes leading to 4-methylthioamphetamine (4-MTA). Part II: Reductive amination and nitropropene route.** *Forensic Science International* 2012;217(1-3):60-70. [Editor's Notes: Presents title study. Contact: Internal Security Agency, Forensic Laboratory, Warsaw 02-134, Poland.]
2. Casale JF, Hays PA. **The characterization of 4- and 5-iodo-2-aminoindan.** *Microgram Journal* 2012;9(1):18-26. [Editor's Notes: Presents title study. Contact: Drug Enforcement Administration, Special Testing and Research Laboratory, Dulles, VA 20166-9509, USA.]
3. Casale JF, Hays PA. **The characterization of  $\alpha$ -pyrrolidinopentiophenone.** *Microgram Journal* 2012;9(1):33-38. [Editor's Notes: Presents title study. Contact: Drug Enforcement Administration, Special Testing and Research Laboratory, Dulles, VA 20166-9509, USA.]

4. Davis S, Rands-Trevor K, Boyd S, Edirisinghe M. **The characterisation of two halogenated cathinone analogues: 3,5-Difluoromethcathinone and 3,5-dichloromethcathinone.** Forensic Science International 2012;217(1-3):139-145. [Editor's Notes: Presents title study. Contact: Queensland Health Forensic and Scientific Services (QHFSS), Brisbane, Australia.]
  
5. Hays PA, Casale JF, Berrier AL. **The characterization of 2-(3-methoxyphenyl)-2-(ethylamino)cyclohexanone (methoxetamine).** Microgram Journal 2012;9(1):3-17. [Editor's Notes: Presents title study. Contact: Drug Enforcement Administration, Special Testing and Research Laboratory, Dulles, VA 20166-9509, USA.]
  
6. Lurie IS, Berrier AL, Casale JF, Iio R, Bozenko JS. **Profiling of illicit fentanyl using UHPLC-MS/MS.** Forensic Science International 2012;220(1-3):191-196. [Editor's Notes: A profiling method for fentanyl in seized drugs using UHPLC-MS/MS is presented. Target analysis was performed for 40 fentanyl processing impurities, several of which are markers for a specific synthetic route (Siegfried or Janssen). This technology is also applicable to the analysis of exhibits containing trace levels of fentanyl in the presence of significantly excess amounts of heroin and/or adulterants. Contact: Drug Enforcement Administration, Special Testing and Research Laboratory, Dulles, VA 20166-9509, USA.]
  
7. Musah RA, Domin MA, Walling MA, Shepard JRE. **Rapid identification of synthetic cannabinoids in herbal samples via direct analysis in real time mass spectrometry.** Rapid Communications in Mass Spectrometry 2012;26(9):1109-1114. [Editor's Notes: Presents title study. Contact: Department of Chemistry, University at Albany, State University of New York (SUNY), 1400 Washington Ave., Albany, NY 12222, USA.]
  
8. Toole KE, Fu S, Shimmon RG, Kraymen N. **Color tests for the preliminary identification of methcathinone and analogues of methcathinone.** Microgram Journal 2012;9(1):27-32. [Editor's Notes: Presents title study. Contact: Australian Nuclear Science and Technology Organisation, Locked Bag b2001, Kirrawee DC NSW 2232, Australia.]
  
9. Trofin IG, Vlad CC, Noja VV, Dabija G. **Identification and characterization of special types of herbal cannabis.** Scientific Bulletin - University "Politehnica" of Bucharest, Series B: Chemistry and Materials Science 2012;74(1):119-130. [Editor's Notes: Presents title study. Contact: General Inspectorate of Romanian Police, Central Laboratory for Drug Analysis and Profiling, Bucharest, Romania.]
  
10. Westphal F, Junge T, Girreser U, Greibl W, Doering C. **Mass, NMR and IR spectroscopic characterization of pentedrone and pentylone and identification of their isocathinone by-products.** Forensic Science International 2012;217(1-3):157-167. [Editor's Notes: Presents title study. Contact: Section Narcotics/Toxicology, State Bureau of Criminal Investigation Schleswig-Holstein, Kiel 24116, Germany.]

### Additional References of Possible Interest:

1. Chittrakarn S, Penjamras P, Keawpradub N. **Quantitative analysis of mitragynine, codeine, caffeine, chlorpheniramine and phenylephrine in a kratom (*Mitragyna Speciosa* Korth.) cocktail using high-performance liquid chromatography.** Forensic Science International 2012;217(1-3):81-86. [Editor's Notes: Presents title study. Contact: Department of Pharmacology, Faculty of Science, Prince of Songkla University, Songkhla 90112, Thailand.]
2. Gambaro V, Arnoldi S, Colombo ML, Dell'Acqua L, Guerrini K, Roda G. **Determination of the active principles of *Catha Edulis*: Quali-quantitative analysis of cathinone, cathine, and phenylpropanolamine.** Forensic Science International 2012;217(1-3):87-92. [Editor's Notes: Presents title study. Contact: Dipartimento di Scienze Farmaceutiche "Pietro Pratesi" Università di Milano, Milan 20133, Italy.]
3. Little JL, Williams AJ, Pshenichnov A, Tkachenko V. **Identification of "known unknowns" utilizing accurate mass data and ChemSpider.** Journal of the American Society for Mass Spectrometry 2012;23(1):179-185. [Editor's Notes: In many cases, an unknown to an investigator is actually known in the chemical literature, a reference database, or an internet resource. We refer to these types of compounds as "known unknowns." ChemSpider is a very valuable internet database of known compounds that can be used in the identification of these types of compounds. The database contains over 26 million entries from hundreds of data sources and is provided as a free resource to the community. Accurate mass mass spectrometry data is used to query the database by either elemental composition or a monoisotopic mass. Searching by elemental composition is the preferred approach. However, it is often difficult to determine a unique elemental composition for compounds with molecular weights greater than 600 Da. In these cases, searching by the monoisotopic mass is advantageous. In either case, the search results are refined by sorting the number of references associated with each compound in descending order. This raises the most useful candidates to the top of the list for further evaluation. These approaches were shown to be successful in identifying "known unknowns" noted in our laboratory. Contact: Eastman Chemical Company, Kingsport, TN 37662, USA.]
4. Meyer MR, Vollmar C, Schwaninger AE, Wolf E, Maurer HH. **New cathinone-derived designer drugs 3-bromomethcathinone and 3-fluoromethcathinone: Studies on their metabolism in rat urine and human liver microsomes using GC-MS and LC-high-resolution MS and their detectability in urine.** Journal of Mass Spectrometry 2012;47(2):253-262. [Editor's Notes: Presents title study. Contact: Department of Experimental and Clinical Toxicology, Institute of Experimental and Clinical Pharmacology and Toxicology, Saarland University, Homburg (Saar), Germany.]

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Employer:			
Your Office Mailing Address (include city, state, and zipcode):			Length of Service:
Business Telephone: (     )     -	Business Fax: (     )     -	Date of Application:	
Email Address:			
Education			
College or University	Degree	Major	
Please Check Which Techniques or Equipment Are Used in Your Laboratory			
<input type="checkbox"/>	Color Tests	<input type="checkbox"/>	UV
<input type="checkbox"/>	Column Chromatography	<input type="checkbox"/>	IR
<input type="checkbox"/>	Microcrystal Tests	<input type="checkbox"/>	CE
<input type="checkbox"/>	Thin Layer Chromatography	<input type="checkbox"/>	GC/MS
<input type="checkbox"/>	GC	<input type="checkbox"/>	Other (please specify)
<input type="checkbox"/>	HPLC	<input type="checkbox"/>	Other (please specify)
Indicate Analytical Problem(s) Nominee Would Like to Have Covered:			
Choice of Seminar Dates:			
1st Choice:		2nd Choice:	
Laboratory Chief/Director:			
Printed Name: _____		Signature: _____	
Title: _____		Date: _____	
Phone: _____			



The U.S. Attorney General has determined that the publication of this periodical is necessary in the transaction of the public business required by the Department of Justice. Information, instruction, and disclaimers are published in the January issues.

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– JULY 2012 –

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1. Hall AB, Coy SL, Nazarov EG, Vouros P. **Rapid separation and characterization of cocaine and cocaine cutting agents by differential mobility spectrometry-mass spectrometry.** *Journal of Forensic Sciences* 2012;57(3):750-756. [Editor's Notes: Ion-mobility based separation methods combined with mass spectrometry can be used often without chromatography, suppress chemical interferences of similar mass, and operate in seconds. We have evaluated differential mobility spectrometry-mass spectrometry (DMS-MS) for performance on adulterated cocaine mixtures. The DMS interface can be adapted to any MS system using atmospheric pressure ionization. Drug cutting agents, typical targets such as cocaine, and drug metabolites are rapidly separated by the DMS ion prefilter. Tests demonstrated characterization of complex mixtures, such as isolation of levamisole, an adulterant with alarming side effects, from a 13 component mixture. Contact: Biomedical Forensic Sciences, Boston University School of Medicine, Boston, MA 02118, USA.]
2. Ko BJ, Suh S, Suh YJ, In MK, Kim SH, Kim JH. **(1S,2S)-1-Methylamino-1-phenyl-2-chloropropane: Route specific marker impurity of methamphetamine synthesized from ephedrine via chloroephedrine.** *Forensic Science International* 2012;221(1-3):92-97. [Editor's Notes: Presents title study. Contact: Supreme Prosecutors' Office, 157, Banpo-daero, Drug Signature Analysis Center, Seoul 137-730, South Korea.]

3. Salouros H, Collins M, Cawley A, Longworth M. **Methylamphetamine synthesis: Does an alteration in synthesis conditions affect the  $\Delta^{13}\text{C}$ ,  $\Delta^{15}\text{N}$  and  $\Delta^2\text{H}$  stable isotope ratio values of the product?** Drug Testing and Analysis 2012;4(5):330-336. [Editor's Notes: The use of stable isotope ratio mass spectrometry (IRMS) analysis as a complementary technique to conventional chemical profiling of fully synthetic illicit drugs such as methylamphetamine is examined. As part of this investigations the stable carbon ( $\Delta^{13}\text{C}$ ), nitrogen ( $\Delta^{15}\text{N}$ ), and hydrogen ( $\Delta^2\text{H}$ ) isotope values in the precursor chemicals (ephedrine and pseudoephedrine) and the resulting methylamphetamine end-products have been measured to determine the synthetic origins of methylamphetamine. In this study, results are presented for  $\Delta^{13}\text{C}$ ,  $\Delta^{15}\text{N}$ , and  $\Delta^2\text{H}$  values in methylamphetamine synthesized from ephedrine and pseudoephedrine by two synthetic routes with varying experimental parameters. It was demonstrated that varying parameters, such as stoichiometry, reaction temperature, reaction time, and reaction pressure, had no effect on the  $\Delta^{13}\text{C}$ ,  $\Delta^{15}\text{N}$ , and  $\Delta^2\text{H}$  isotope values of the final methylamphetamine product, within measurement uncertainty. Therefore the value of the IRMS technique in identifying the synthetic origin of precursors, such as ephedrine and pseudoephedrine, is not compromised by the potential variation in synthetic method that is expected from one batch to the next. Contact: National Measurement Institute, Sydney, Australia.]

#### **Additional References of Possible Interest:**

1. Bassindale T. **Quantitative analysis of methamphetamine in hair of children removed from clandestine laboratories - Evidence of passive exposure?** Forensic Science International 2012;219(1-3):179-182. [Editor's Notes: In New Zealand, many children have been removed from clandestine laboratories following police intervention. In the last few years it has become standard procedure that these children have hair samples taken and these samples are submitted to the laboratory for analysis. There are various mechanisms for the incorporation of drugs into hair. The hair follicle has a rich blood supply, so any drug that may be circulating in the blood can be incorporated into the growing hair. Another mechanism is via external contamination, such as spilling a drug on the hair or through exposure to fumes or vapors. Hair samples were analyzed for methamphetamine and amphetamine. From the 52 cases analyzed 38 (73%) were positive for methamphetamine ( $>0.1$  ng/mg) and amphetamine was detected in 34 of these cases. In no case was amphetamine detected without methamphetamine. The hair washes (prior to extraction) were also analyzed (quantified in 30 of the pos. cases) and only 3 had a wash to hair ratio of  $>0.1$  (all were  $<0.5$ ), which may be indicative of a low level of external contamination. This low level of evidence of external contamination suggests that the children are exposed to methamphetamine and are incorporating it into the hair through the blood stream. Contact: Institute of Environmental Science and Research (ESR) Ltd, Kenepuru Science Centre, Porirua, New Zealand.]
2. Guo Z, Zheng H, Lu Y, Wei Y. **Isolation and purification of heroin from heroin street samples by preparative high performance liquid chromatography.** Forensic Science International 2012, Ahead of Print. [Editor's Notes: Presents title study. Contact: State Key Laboratory of Chemical Resource Engineering, Beijing University of Chemical Technology, Beijing 100029, China.]

3. Olds WJ, Sundarajoo S, Selby M, Cletus B, Fredericks PM, Izake EL. **Noninvasive, quantitative analysis of drug mixtures in containers using spatially offset Raman spectroscopy (SORS) and multivariate statistical analysis.** Applied Spectroscopy 2012;66(5):530-537. [Editor's Notes: Presents title study. Contact: Discipline of Chemistry, Faculty of Science and Technology, Queensland University of Technology, Brisbane, Queensland 4001, Australia.]
  
4. Pal R, Megharaj M, Naidu R, Klass G, Cox M, Kirkbride KP. **Degradation in soil of precursors and by-products associated with the illicit manufacture of methylamphetamine: Implications for clandestine drug laboratory investigation.** Forensic Science International 2012, Ahead of Print. [Editor's Notes: Presents title study. Contact: Centre for Environmental Risk Assessment and Remediation, University of South Australia, Adelaide, Australia.]
  
5. Penido CAFO, Silveira L, Pacheco MTT. **Quantification of binary mixtures of cocaine and adulterants using dispersive Raman and FT-IR spectroscopy and principal component regression.** Instrumentation Science & Technology 2012;40 (5):441-456. [Editor's Notes: Presents title study. Contact: Biomedical Engineering Center, Parque Tecnológico de São José dos Campos, Universidade Camilo Castelo Branco - UNICASTELO, ZIP, Brazil.]
  
6. Plotka JM, Morrison C, Adam D, Biziuk M. **Chiral analysis of chloro intermediates of methylamphetamine by one-dimensional and multidimensional NMR and GC/MS.** Analytical Chemistry 2012, Ahead of Print. [Editor's Notes: Presents title study. Contact: Department of Analytical Chemistry, Chemical Faculty, Gdansk University of Technology, Gdansk 80-233, Poland.]
  
7. Trofin IG, Dabija G, Vaireanu DI, Filipescu L. **Long - term storage and cannabis oil stability.** Revista de Chimie 2012;63(3):293-297. [Editor's Notes: Presents title study. Contact: Central Laboratory for Drug Analysis and Profiling, General Inspectorate of Romanian Police, Bucharest, Romania.]
  
8. Trofin IG, Dabija G, Vaireanu DI, Filipescu L. **The influence of long-term storage conditions on the stability of cannabinoids derived from cannabis resin.** Revista de Chimie 2012;63(4):422-427. [Editor's Notes: Presents title study. Contact: Central Laboratory for Drug Analysis and Profiling, General Inspectorate of Romanian Police, Bucharest, Romania.]
  
9. Tsumura Y, Aoki R, Tokieda Y, Akutsu M, Kawase Y, Kataoka T, Takagi T, Mizuno T, Fukada M, Fujii H, Kurahashi K. **A survey of the potency of Japanese illicit cannabis in fiscal year 2010.** Forensic Science International 2012;221(1-3):77-83. [Editor's note: Presents title study. Contact: Kobe Branch, Narcotics Control Department, Kinki Regional Bureau of Health and Welfare (Kinki NCD), Labour and Welfare (MHLW), Ministry of Health, Chuo-ku, Kobe, Japan.]

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## SCIENTIFIC MEETINGS

**Title:** The 41<sup>st</sup> Annual MAFS Meeting

**Sponsoring Organization:** Midwestern Association of Forensic Scientists

**Inclusive Dates:** September 24 - 28, 2012

**Location:** Hilton Milwaukee City Center (Milwaukee, WI)

**Contact Information:** See website

**Website:** [www.mafs.net](http://www.mafs.net)

**Title:** Southern Association of Forensic Scientists 2012 Annual Meeting

**Sponsoring Organization:** Southern Association of Forensic Scientists

**Inclusive Dates:** September 30 - October 4, 2012

**Location:** Hilton Pensacola Beach Gulf Front (Pensacola Beach, FL)

**Contact Information:** See website

**Website:** [www.southernforensic.org](http://www.southernforensic.org)



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Name: (PRINT NAME EXACTLY AS IT IS TO APPEAR ON CERTIFICATE)		Title:	
Employer:			
Your Office Mailing Address (include city, state, and zipcode):			Length of Service:
Business Telephone: (     )     -	Business Fax: (     )     -	Date of Application:	
Email Address:			
Education			
College or University	Degree	Major	
Please Check Which Techniques or Equipment Are Used in Your Laboratory			
<input type="checkbox"/>	Color Tests	<input type="checkbox"/>	UV
<input type="checkbox"/>	Column Chromatography	<input type="checkbox"/>	IR
<input type="checkbox"/>	Microcrystal Tests	<input type="checkbox"/>	CE
<input type="checkbox"/>	Thin Layer Chromatography	<input type="checkbox"/>	GC/MS
<input type="checkbox"/>	GC	<input type="checkbox"/>	Other (please specify)
<input type="checkbox"/>	HPLC	<input type="checkbox"/>	Other (please specify)
Indicate Analytical Problem(s) Nominee Would Like to Have Covered:			
Choice of Seminar Dates:			
1st Choice:		2nd Choice:	
Laboratory Chief/Director:			
Printed Name: _____		Signature: _____	
Title: _____		Date: _____	
Phone: _____			



The U.S. Attorney General has determined that the publication of this periodical is necessary in the transaction of the public business required by the Department of Justice. Information, instruction, and disclaimers are published in the January issues.

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– AUGUST 2012 –

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### SELECTED REFERENCES

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1. Moosmann B, Kneisel S, Girreser U, Brecht V, Westphal F, Auwaerter V. **Separation and structural characterization of the synthetic cannabinoids JWH-412 and 1-[(5-fluoropentyl)-1H-indol-3yl]-(4-methylnaphthalen-1-yl)methanone using GC-MS, NMR analysis and a flash chromatography system.** *Forensic Science International* 2012, 220(1-3), e17-e22. [Editor's Notes: Presents title study. Contact: Institute of Forensic Medicine, Department of Forensic Toxicology, University Medical Center Freiburg, Freiburg 79104, Germany.]
2. Rittgen J, Puetz M, Zimmermann R. **Identification of fentanyl derivatives at trace levels with nonaqueous capillary electrophoresis-electrospray-tandem mass spectrometry ( $MS^n$ ,  $n = 2, 3$ ): Analytical method and forensic applications.** [Editor's Notes: A nonaqueous capillary electrophoresis (NACE)-ESI- $MS^n$  procedure was developed for the separation and identification of six fentanyl derivatives including fentanyl, cis- and trans-methylfentanyl, sufentanil, alfentanil, and carfentanil. Their fragmentation pattern in  $MS^n$  experiments were investigated as well as the influence of the sheath-liquid mixtures and the influence of the inside diameter of the fused silica capillary on the peak shape and the signal to noise ratio. Method validation included

determination of the detection limits (about 1-2 nmol/L) and the repeatability of migration time (at most 0.07% relative standard deviation). The NACE-MS procedure was successfully applied for the analysis of real samples from seizures in illegal fentanyl laboratories. Contact: Bundeskriminalamt - Federal Criminal Police Office, Forensic Science Institute, Wiesbaden, Germany.]

3. Sekula K, Zuba D, Stanaszek R. **Identification of naphthoylindoles acting on cannabinoid receptors based on their fragmentation patterns under ESI-QTOFMS.** Journal of Mass Spectrometry 2012;47(5):632-643. [Editor's Notes: The mass spectral behavior of 12 synthetic cannabinoids from the naphthoylindole family under electrospray ionization (ESI) was investigated. LC-QTOFMS experiments were performed in 3 modes (low fragmentor voltage, high fragmentor voltage with/without collision energy), and they enabled the identification of protonated molecules and main ions. A general fragmentation pattern under this ionization method was proposed, and mechanisms of ion formation were discussed. The developed procedure allowed the determination of substituent groups of the core naphthoylindole structure and distinction between positional isomers. The obtained results were used for the prediction of the ESI-MS spectra for many naphthoylindoles with a high affinity to cannabinoid receptors. Similarities and differences between ESI-MS and electron impact-MS spectra of naphthoylindoles were discussed. Contact: Department of Forensic Toxicology, Institute of Forensic Research, Krakow, Poland.]

#### Additional References of Possible Interest:

1. Baron M, Elie M, Elie L. **An analysis of legal highs-do they contain what it says on the tin?** Drug Testing and Analysis 2011;3(9):576-581. [Editor's Notes: Presents title study. Contact: School of Natural & Applied Sciences, Faculty of Health & Life Sciences, University of Lincoln, United Kingdom.]
2. Chan KW, Tan GH, Wong RC. **ICP-MS method validation for the analysis of trace elements in illicit heroin.** Analytical Letters 2012;45(9):1122-1132. [Editor's Notes: The analysis of the trace elements present in the street doses of heroin has been undertaken to estimate the elemental composition and to cluster the case samples. Inductively coupled plasma-mass spectrometry (ICP-MS) was optimized to quantify 18 trace elements simultaneously. The capability of the optimized method was assessed by analysis of forty case samples. Contact: Department of Chemistry, University of Malaya, Kuala Lumpur, Malaysia.]
3. Salomone A, Gerace E, D'Urso F, Di Corcia D, Vincenti M. **Simultaneous analysis of several synthetic cannabinoids, THC, CBD and CBN, in hair by ultra-high performance liquid chromatography tandem mass spectrometry. Method validation and application to real samples.** Journal of Mass Spectrometry 2012; 47(5):604-610. [Editor's Notes: Presents title study. Contact: Centro Regionale Antidoping "A. Bertinaria", Turin, Italy.]

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Name: (PRINT NAME EXACTLY AS IT IS TO APPEAR ON CERTIFICATE)		Title:	
Employer:			
Your Office Mailing Address (include city, state, and zipcode):			Length of Service:
Business Telephone: (     )     -	Business Fax: (     )     -	Date of Application:	
Email Address:			
Education			
College or University	Degree	Major	
Please Check Which Techniques or Equipment Are Used in Your Laboratory			
<input type="checkbox"/>	Color Tests	<input type="checkbox"/>	UV
<input type="checkbox"/>	Column Chromatography	<input type="checkbox"/>	IR
<input type="checkbox"/>	Microcrystal Tests	<input type="checkbox"/>	CE
<input type="checkbox"/>	Thin Layer Chromatography	<input type="checkbox"/>	GC/MS
<input type="checkbox"/>	GC	<input type="checkbox"/>	Other (please specify)
<input type="checkbox"/>	HPLC	<input type="checkbox"/>	Other (please specify)
Indicate Analytical Problem(s) Nominee Would Like to Have Covered:			
Choice of Seminar Dates:			
1st Choice:		2nd Choice:	
Laboratory Chief/Director:			
Printed Name: _____		Signature: _____	
Title: _____		Date: _____	
Phone: _____			



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– SEPTEMBER 2012 –

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1. Casale JF, Hays PA. **The characterization of 2-(5-methoxy-1-benzofuran-3-yl)-N,N-dimethylethanamine (5-MeO-BFE) and differentiation from its N-ethyl analog.** *Microgram Journal* 2012;9(1);39-45. [Editor's Notes: Presents title study. Contact: Special Testing and Research Laboratory, U.S. Department of Justice, Drug Enforcement Administration, Dulles, VA 20166-9509, USA.]
2. Deng QP, Tie C, Zhou YL, Zhang XX. **Cocaine detection by structure-switch aptamer-based capillary zone electrophoresis.** *Electrophoresis* 2012;33(9-10):1465-1470. [Editor's Notes: Presents title study. Contact: Beijing National Laboratory for Molecular Sciences (BNLMS), Key Laboratory of Bioorganic Chemistry and Molecular Engineering of Ministry of Education, Institute of Analytical Chemistry, College of Chemistry, Peking University, Beijing, China.]
3. Kneisel S, Bisel P, Brecht V, Broecker S, Mueller M, Auwaerter V. **Identification of the cannabimimetic AM-1220 and its azepane isomer (N-methylazepan-3-yl)-3-(1-naphthoyl)indole in a research chemical and several herbal mixtures.** *Forensic Toxicology* 2012;30(2):126-134. [Editor's Notes: Presents title study. Contact: Institute of Forensic Medicine, University Medical Center Freiburg, Albertstr. 9, Freiburg 79104, Germany.]



4. Kunalan V, Kerr WJ, Nic Daeid N. **Investigation of the reaction impurities associated with methylamphetamine synthesized using the nagai method.** *Analytical Chemistry* 2012;84(13):5744-5752. [Editor's Notes: Presents title study. Contact: Centre for Forensic Science, Department of Pure and Applied Chemistry, WestCHEM, University of Strathclyde, Scotland, United Kingdom.]
5. Uchiyama N, Kawamura M, Kikura-Hanajiri R, Goda Y. **Identification of two new-type synthetic cannabinoids, N-(1-adamantyl)-1-pentyl-1H-indole-3-carboxamide (APICA) and N-(1-adamantyl)-1-pentyl-1H-indazole-3-carboxamide (APINACA), and detection of five synthetic cannabinoids, AM-1220, AM-2233, AM-1241, CB-13 (CRA-13), and AM-1248, as designer drugs in illegal products.** *Forensic Toxicology* 2012;30(2):114-125. [Editor's Notes: Presents title study. Contact: National Institute of Health Sciences, 1-18-1 Kamiyoga, Setagaya-ku, Tokyo 158-8501, Japan.]

#### **Additional References of Possible Interest:**

1. Broecker S, Pragst F. **Isomerization of cannabidiol and  $\Delta^9$ -tetrahydrocannabinol during positive electrospray ionization. In-source hydrogen/deuterium exchange experiments by flow injection hybrid quadrupole-time-of-flight mass spectrometry.** *Rapid Communications in Mass Spectrometry* 2012;26(12):1407-1414. [Editor's Notes: Presents title study. Contact: Institute of Legal Medicine, University Hospital Charite, 10559 Berlin, Germany.]
2. Grabenauer M, Krol WL, Wiley JL, Thomas BF. **Analysis of synthetic cannabinoids using high-resolution mass spectrometry and mass defect filtering: Implications for nontargeted screening of designer drugs.** *Analytical Chemistry* 2012;84(13):5574-5581. [Editor's Notes: Detection of new designer drugs remains an analytical challenge because of the ability of manufacturers to rapidly substitute closely related analogs for banned substances. Traditional targeted mass spectrometry methods rely on library searches, known masses, or multiple reaction monitoring (MRM) transitions and are therefore often unable to detect or identify recently discovered or yet unreported designer drug analogs. High-resolution mass spectrometry in conjunction with mass defect filtering is presented as a method for non-targeted analysis to detect both known and novel analogs of designer drugs. The technique is applied in depth to a family of designer drugs composed of indole-derived synthetic cannabinoids closely related to JWH-018. A single mass defect filter with a 50 mDa window encompasses over 80% of all currently published structures in this family. Searching for precursor ions of common fragment ions enables detection of compounds with mass defects that fall outside the range of mass defect filter parameters. Application of a mass defect filter to fragment ions prior to precursor ion searching increases the breadth of analogs that can be detected. The combined approach defines a broad-spectrum search for related molecules. Contact: RTI International, Research Triangle Park, NC 27709-2194 USA.]
3. Kneisel S, Auwaerter V. **Analysis of 30 synthetic cannabinoids in serum by liquid chromatography-electrospray ionization tandem mass spectrometry after liquid-liquid extraction.** *Journal of Mass Spectrometry* 2012;47(7):825-835. [Editor's Notes: A fully validated method for the analysis of 30 synthetic cannabinoids in human serum utilizing liquid-liquid extraction and LC/ESIMS. The method proved to be suitable for the quantification of 27 substances. The limits of detection ranged from 0.01 to

2.0 ng/mL, whereas the lower limits of quantification ranged from 0.1 to 2.0 ng/mL. The presented method was successfully applied to 833 authentic serum samples. Contact: University Medical Center Freiburg, Institute of Forensic Medicine, Freiburg 79104, Germany.]

4. Mahdy T, El-Shihi TH, Emara MM, Giorgi M. **New HPLC method to detect individual opioids (heroin and tramadol) and their metabolites in the blood of rats on combination treatment.** Journal of Chromatographic Science 2012;50(8):658-665. [Editor's Notes: Presents title study. Contact: Analytical Toxicology Laboratory, Forensic Medicine Authority, Cairo, Egypt.]
5. Meier L, Berchtold C, Schmid S, Zenobi R. **Sensitive detection of drug vapors using an ion funnel interface for secondary electrospray ionization mass spectrometry.** Journal of Mass Spectrometry 2012;47(5):555-559. [Editor's Notes: Presents title study. Contact: Department of Chemistry and Applied Biosciences, ETH Zurich, Zurich, Switzerland.]
6. Penn HJ, Langman LJ, Unold D, Shields J, Nichols JH. **Detection of synthetic cannabinoids in herbal incense products.** Clinical Biochemistry 2011;44(13):1163-1165. [Editor's Notes: The ability of clinical drug of abuse tests to detect synthetic cannabinoids was investigated. Contact: Department of Laboratory Medicine and Pathology, Mayo Clinic, Rochester, MN 55905 USA.]
7. Plotka JM, Biziuk M, Morrison C. **Common methods for the chiral determination of amphetamine and related compounds I. Gas, liquid and thin-layer chromatography.** TrAC, Trends in Analytical Chemistry 2011;30(7):1139-1158. [Editor's Notes: Presents title review. Contact: Department of Analytical Chemistry, Chemical Faculty, Gdansk University of Technology, 80-233 Gdansk, Poland.]

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Business Telephone: (     )     -	Business Fax: (     )     -	Date of Application:	
Email Address:			
Education			
College or University	Degree	Major	
Please Check Which Techniques or Equipment Are Used in Your Laboratory			
<input type="checkbox"/>	Color Tests	<input type="checkbox"/>	UV
<input type="checkbox"/>	Column Chromatography	<input type="checkbox"/>	IR
<input type="checkbox"/>	Microcrystal Tests	<input type="checkbox"/>	CE
<input type="checkbox"/>	Thin Layer Chromatography	<input type="checkbox"/>	GC/MS
<input type="checkbox"/>	GC	<input type="checkbox"/>	Other (please specify)
<input type="checkbox"/>	HPLC	<input type="checkbox"/>	Other (please specify)
Indicate Analytical Problem(s) Nominee Would Like to Have Covered:			
Choice of Seminar Dates:			
1st Choice:		2nd Choice:	
Laboratory Chief/Director:			
Printed Name: _____		Signature: _____	
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1. Brandt SD, Freeman S, Sumnall HR, Measham F, Cole J. **Analysis of NRG ‘legal highs’ in the UK: Identification and formation of novel cathinones.** *Drug Testing and Analysis* 2011;3(9):569-575. [Editor’s Notes: Presents title study. Contact: School of Pharmacy and Biomolecular Sciences, Liverpool John Moores University, Liverpool, United Kingdom.]
2. Ernst L, Krueger K, Lindigkeit R, Schiebel HM, Beuerle T. **Synthetic cannabinoids in “spice-like” herbal blends: First appearance of JWH-307 and recurrence of JWH-018 on the German market.** *Forensic Science International* 2012;222(1-3):216-222. [Editor’s Notes: Presents title study. Contact: Chemistry Department, Central NMR Laboratory, Technische Universitaet Braunschweig, Braunschweig 38106, Germany.]
3. Mohr S, Pilaj S, Schmid MG. **Chiral separation of cathinone derivatives used as recreational drugs by cyclodextrin-modified capillary electrophoresis.** *Electrophoresis* 2012;33(11):1624-1630. [Editor’s Notes: Presents title study. Contact: Department of Pharmaceutical Chemistry, Karl-Franzens-University Graz, Graz, Austria.]

4. Zuba D, Sekula K, Buczek A. **Identification and characterization of 2,5-dimethoxy-4-nitro-beta-phenethylamine (2C-N) - A new member of 2C-series of designer drug.** Forensic Science International 2012;222(1-3):298-305. [Editor's Notes: Presents title study. Contact: Institute of Forensic Research, Krakow 31033, Poland.]

#### **Additional References of Possible Interest:**

1. Chan K, Tan G, Wong RCS. **Gas Chromatographic Method Optimization and Statistical Validation for the Determination of Trace Impurities in Street Doses of Heroin.** Analytical Letters 2012;45(10):1156-1171. [Editor's Notes: This study uses manufacturing impurities and principle component analysis (PCA) to determine if 252 street samples of heroin originated from a common production batch. Contact: Department of Chemistry, University of Malaya, Kuala Lumpur, 50603 Malaysia.]
2. Choe S, Lee E, Jin G, Lee YH, Kim SY, Choi H, Chung H, Hwang BY, Kim S. **Genetic and chemical components analysis of Papaver setigerum naturalized in Korea.** Forensic Science International 2012;222(1-3):387-393. [Editor's Notes: Presents title study. Contact: Narcotics Analysis Division, National Forensic Service, Seoul, South Korea.]
3. Choe S, Kim S, Lee C, Yang W, Park Y, Choi H, Chung H, Lee D, Hwang BY. **Species identification of Papaver by metabolite profiling.** Forensic Science International 2011;211(1-3):51-60. [Editor's Notes: Presents title study. Contact: Narcotics Analysis Division, National Forensic Service, Seoul, South Korea.]
4. Soerensen LK, Hasselstroem JB. **A hydrophilic interaction liquid chromatography electrospray tandem mass spectrometry method for the simultaneous determination of  $\gamma$ -hydroxybutyrate and its precursors in forensic whole blood.** Forensic Science International 2012;222(1-3):352-359. [Editor's Notes: Presents title study. Contact: Section for Toxicology and Drug Analysis, Department of Forensic Medicine, Aarhus University, Aarhus N 8200, Denmark.]
5. Wang CC, Chen JL, Chen YL, Cheng HL, Wu SM. **A novel stacking method of repetitive large volume sample injection and sweeping MEKC for determination of androgenic steroids in urine.** Analytica Chimica Acta 2012;744:99-104. [Editor's Notes: A stacking capillary electrophoresis, repetitive large volume sample injection, and sweeping MEKC (rLVSI-sweeping MEKC) method was developed for the analysis of testosterone, epitestosterone, and epitestosterone glucuronide in urine. This method provides better sensitivity enhancement than the traditional large volume sample stacking-sweeping strategies. Contact: School of Pharmacy, College of Pharmacy, Kaohsiung Medical University, Taiwan.]

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<b>DEA State and Local Forensic Chemist Seminar Application</b>			
Name: (PRINT NAME EXACTLY AS IT IS TO APPEAR ON CERTIFICATE)		Title:	
Employer:			
Your Office Mailing Address (include city, state, and zipcode):			Length of Service:
Business Telephone: (     )     -	Business Fax: (     )     -	Date of Application:	
Email Address:			
Education			
College or University	Degree	Major	
Please Check Which Techniques or Equipment Are Used in Your Laboratory			
<input type="checkbox"/>	Color Tests	<input type="checkbox"/>	UV
<input type="checkbox"/>	Column Chromatography	<input type="checkbox"/>	IR
<input type="checkbox"/>	Microcrystal Tests	<input type="checkbox"/>	CE
<input type="checkbox"/>	Thin Layer Chromatography	<input type="checkbox"/>	GC/MS
<input type="checkbox"/>	GC	<input type="checkbox"/>	Other (please specify)
<input type="checkbox"/>	HPLC	<input type="checkbox"/>	Other (please specify)
Indicate Analytical Problem(s) Nominee Would Like to Have Covered:			
Choice of Seminar Dates:			
1st Choice:		2nd Choice:	
Laboratory Chief/Director:			
Printed Name: _____		Signature: _____	
Title: _____		Date: _____	
Phone: _____			



*The U.S. Attorney General has determined that the publication of this periodical is necessary in the transaction of the public business required by the Department of Justice. Information, instruction, and disclaimers are published in the January issues.*

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– NOVEMBER 2012 –

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### SELECTED REFERENCES

[The Selected References section is a compilation of recent publications of presumed interest to forensic chemists. Unless otherwise stated, all listed citations are published in English. Abbreviated mailing address information duplicates that which is provided by the abstracting service. Patents and Proceedings are reported only by their *Chemical Abstracts* citation number. For full text copies of any of the articles listed, you may email the DEA Library at [dea.library@usdoj.gov](mailto:dea.library@usdoj.gov).]

1. Abdel-Hay KM, DeRuiter J, Clark CR. **Differentiation of methoxybenzoyl-piperazines (OMeBzPs) and methylenedioxybenzylpiperazines (MDBPs) by GC-IRD and GC-MS.** *Drug Testing and Analysis* 2012;4(6):430-440. [Editor's Notes: Presents title study. Contact: Harrison School of Pharmacy, Auburn University, Auburn, AL 36849-5320 USA.]
2. Gottardo R, Bertaso A, Pascali J, Sorio D, Musile G, Trapani E, Seri C, Serpelloni G, Tagliaro F. **Micellar electrokinetic chromatography: A new simple tool for the analysis of synthetic cannabinoids in herbal blends and for the rapid estimation of their log P values.** *Journal of Chromatography A* 2012;1267:198-205. [Editor's Notes: Presents title study. Contact: Department of Public Health and Community Medicine, Unit of Forensic Medicine, University of Verona, Verona, Italy.]
3. Higuchi M, Saito K. **Rapid screening for synthetic cannabinoids and cathinones using direct analysis in real time (DART)-TOF-MS.** *Bunseki Kagaku* 2012;61(8):705-711 (Japanese). [Editor's Notes: A screening method that uses Direct Analysis in Real Time (DART) time-of-flight (TOF) mass spectrometry (MS) was developed. The mass spectra clearly showed all peaks representing the protonated molecules of 14

synthetic cannabinoids and 3 synthetic cathinones. The analysis of samples of herbal products, plant leaves, and tablets was possible without any pre-processing of the samples. As a result, stimulants, cannabis components, and several synthetic cannabinoids (JWH-210, AM2201, JWH-203, JWH-081, 4-methyleth-cathinone, and naphyrone) were identified in each sample. Contact: Criminal Investigation Laboratory, Saitama Prefectural Police H.Q., Urawa-ku, Saitama-shi, Saitama 330-0042, Japan.]

4. Maheux CR, Copeland CR. **Chemical analysis of two new designer drugs: Buphedrone and pentedrone.** Drug Testing and Analysis 2012;4(1):17-23. [Editor's Notes: Presents title study. Contact: Canada Border Services Agency, Ottawa, Ontario, Canada.]
5. Vardakou I, Pistos C, Dona A, Spiliopoulou C, Athanaselis S. **Naphyrone: A "legal high" not legal any more.** Drug and Chemical Toxicology 2012;35(4):467-471. [Editor's Notes: This review presents information about naphyrone's safety profile, clinical data, and analytical profile. Contact: Department of Forensic Medicine and Toxicology, School of Medicine, National and Kapodistrian University of Athens, Athens, Greece.]

#### Additional References of Possible Interest:

1. Cole C, Jones L, McVeigh J, Kicman A, Syed Q, Bellis M. **Adulterants in illicit drugs: A review of empirical evidence.** Drug Testing and Analysis 2011;3(2):89-96. [Editor's Notes: Presents title review. Contact: Centre for Public Health, Liverpool John Moores University, United Kingdom.]
2. Deconinck E, Canfyn M, Sacre PY, Baudewyns S, Courselle P, De Beer JO. **A validated GC-MS method for the determination and quantification of residual solvents in counterfeit tablets and capsules.** Journal of Pharmaceutical and Biomedical Analysis 2012;70:64-70. [Editor's Notes: A fast headspace GC/MS method was developed and validated for the detection and quantification of residual solvents in counterfeit tablets and capsules. The method was validated for ten solvents including ethanol, 2-propanol, acetone, ethylacetate, chloroform, carbon tetrachloride, benzene, toluene, dichloromethane, and ethylbenzene. Contact: Division of Food, Medicines and Consumer Safety, Section Medicinal Products, Scientific Institute of Public Health (WIV-ISP), J. Wytmanstraat 14, Brussels B-1050, Belgium.]
3. Holness HK, Jamal A, Mebel A, Almirall JR. **Separation mechanism of chiral impurities, ephedrine and pseudoephedrine, found in amphetamine-type substances using achiral modifiers in the gas phase.** Analytical and Bioanalytical Chemistry 2012;404(8):2407-2416. [Editor's Notes: Presents title study. Contact: Department of Chemistry and Biochemistry and International Forensic Research Institute, Florida International University, Miami, FL 33199, USA.]
4. Lund H, Loevsletten K, Paus E, Halvorsen TG, Reubsæet L. **Immuno-MS based targeted proteomics: Highly specific, sensitive, and reproducible human chorionic gonadotropin determination for clinical diagnostics and doping analysis.** Analytical Chemistry 2012;84(18):7926-7932. [Editor's Notes: Presents title study. Contact: Department of Pharmaceutical Chemistry, School of Pharmacy, University of Oslo, Oslo, Norway.]

5. Rao P, Reddy GLN, Vikram KS, Ramana JV, Chattopadhyay N, Basu AK, Srivastava S, Sarin RK, Raju VS, Kumar S. **Simultaneous determination of  $^{14}\text{N}$  and  $^{15}\text{N}$  isotopes in opium by proton induced gamma-ray emission technique.** Journal of Radioanalytical and Nuclear Chemistry 2012;294(1):127-130. [Editor's Notes: The determination of  $^{14}\text{N}$  and  $^{15}\text{N}$  isotopes in opium by proton induced gamma-ray emission (PIGE) technique is reported. The isotopic ratio of  $^{14}\text{N}$  and  $^{15}\text{N}$  can be used in the determination of the area of origin of illicit drugs. The measurement, non-destructive in nature, is performed on pellets made up of opium powders and is based on the prompt detection of 2.313 and 4.4 MeV gamma-rays emanating from  $^{14}\text{N}(\text{p},\text{p}'\gamma)^{14}\text{N}$  and  $^{15}\text{N}(\text{p},\alpha\text{p}\gamma)^{12}\text{C}$  nuclear reactions respectively, induced simultaneously by 3.6-3.8 MeV proton beam. Contact: National Centre for Compositional Characterization of Materials, Bhabha Atomic Research Centre, ECIL Post 500062, India.]

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### THE JOURNAL/TEXTBOOK COLLECTION EXCHANGE

The Journal/Textbook Collection Exchange is a service intended to facilitate the transfer of unwanted journals and textbooks to forensic libraries or other *Microgram* subscribers.

The DEA Office of Forensic Sciences is looking for donation of the following items:

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Business Telephone: (     )     -	Business Fax: (     )     -	Date of Application:	
Email Address:			
Education			
College or University	Degree	Major	
Please Check Which Techniques or Equipment Are Used in Your Laboratory			
<input type="checkbox"/>	Color Tests	<input type="checkbox"/>	UV
<input type="checkbox"/>	Column Chromatography	<input type="checkbox"/>	IR
<input type="checkbox"/>	Microcrystal Tests	<input type="checkbox"/>	CE
<input type="checkbox"/>	Thin Layer Chromatography	<input type="checkbox"/>	GC/MS
<input type="checkbox"/>	GC	<input type="checkbox"/>	Other (please specify)
<input type="checkbox"/>	HPLC	<input type="checkbox"/>	Other (please specify)
Indicate Analytical Problem(s) Nominee Would Like to Have Covered:			
Choice of Seminar Dates:			
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Laboratory Chief/Director:			
Printed Name: _____		Signature: _____	
Title: _____		Date: _____	
Phone: _____			



*The U.S. Attorney General has determined that the publication of this periodical is necessary in the transaction of the public business required by the Department of Justice. Information, instruction, and disclaimers are published in the January issues.*

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– DECEMBER 2012 –

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1. Abiedalla YFH, Abdel-Hay K, DeRuiter J, Clark CR. **Synthesis and GC-MS analysis of a series of homologs and regioisomers of 3,4-methylenedioxypyrovalerone (MDPV).** *Forensic Science International* 2012;223(1-3):189-197. [Editor's Notes: Presents title study. Contact: Department of Pharmacal Sciences, Harrison School of Pharmacy, Auburn University, Auburn, AL 36849, USA.]
2. Couch RAF, Madhavaram H. **Phenazepam and cannabinomimetics sold as herbal highs in New Zealand.** *Drug Testing and Analysis* 2012;4(6):409-414. [Editor's Notes: Presents title study. Contact: Auckland City Hospital, Auckland, New Zealand.]
3. Ivanova B, Spiteller M. **Quantitative analysis of substituted N,N-dimethyl-tryptamines in the presence of natural type XII alkaloids.** *Natural Product Communications* 2012;7(10):1273-1276. [Editor's Notes: This paper presents the qualitative and quantitative analysis of N,N-dimethyltryptamine, 5-methoxy-N,N-dimethyltryptamine, and 5-hydroxy-N,N-dimethyltryptamine in the presence of  $\beta$ -carbolines by HPLC, ESI-MS, MALDI-MS, and Raman spectroscopy. Contact: Institute of Environmental Research, Department of Environmental Chemistry and Analytical Chemistry, University of Dortmund, Dortmund 44221, Germany.]



4. NicDaeid N, Meier-Augenstein W, Kemp HF, Sutcliffe OB. **Using isotopic fractionation to link precursor to product in the synthesis of (±)-mephedrone: A new tool for combating “legal high” drugs.** *Analytical Chemistry* 2012;84(20):8691-8696. [Editor's Notes: Presents title study. Contact: Centre for Forensic Science, Department of Pure and Applied Chemistry, University of Strathclyde, Glasgow, United Kingdom.]
5. Power JD, McDermott SD, Talbot B, O'Brien JE, Kavanagh P. **The analysis of amphetamine-like cathinone derivatives using positive electrospray ionization with in-source collision-induced dissociation.** *Rapid Communications in Mass Spectrometry* 2012;26(22):2601-2611. [Editor's Notes: Presents title study. Contact: Forensic Science Laboratory, Garda HQ, Dublin 8, Ireland.]
6. Valoti E, Casagni E, Dell'Acqua L, Pallavicini M, Roda G, Rusconi C, Straniero V, Gambaro V. **Identification of 1-butyl-3-(1-(4-methyl)naphthoyl)indole detected for the first time in “herbal high” products on the Italian market.** *Forensic Science International* 2012;223(1-3):e42-e46. [Editor's Notes: Presents title study. Contact: Dipartimento di Scienze Farmaceutiche “Pietro Pratesi,” Università degli Studi di Milano, Milan I-20133, Italy.]
7. Westphal F, Junge T. **Ring positional differentiation of isomeric N-alkylated fluorocathinones by gas chromatography/tandem mass spectrometry.** *Forensic Science International* 2012;223(1-3):97-105. [Editor's Notes: Presents title study. Contact: Section Narcotics/Toxicology, State Bureau of Criminal Investigation Schleswig-Holstein, Kiel D-24116, Germany.]

#### **Additional References of Possible Interest:**

1. Fragkaki AG, Farmaki E, Thomaidis N, Tsantili-Kakoulidou A, Angelis YS, Koupparis M, Georgakopoulos C. **Comparison of multiple linear regression, partial least squares and artificial neural networks for prediction of gas chromatographic relative retention times of trimethylsilylated anabolic androgenic steroids.** *Journal of Chromatography, A* 2012;1256:232-239. [Editor's Notes: Presents title study. Contact: Doping Control Laboratory of Athens, Olympic Athletic Center of Athens “Spyros Louis,” Kifisias 37, Maroussi, Greece 15123.]
2. Juerschik S, Agarwal B, Kassebacher T, Sulzer P, Mayhew CA, Maerk TD. **Rapid and facile detection of four date rape drugs in different beverages utilizing proton transfer reaction mass spectrometry (PTR-MS).** *Journal of Mass Spectrometry* 2012;47(9):1092-1097. [Editor's Notes: The analysis of four date rape drugs (chloral hydrate, trichloroethanol, GBL, and 1,4-butanediol) in several beverages by Proton Transfer Reaction Mass Spectrometry (PTR-MS) is presented. Sample introduction by dynamic headspace sampling and direct liquid injection are also compared. Contact: IONICON Analytik GmbH, 6020 Innsbruck, Austria.]
3. Koskela H, Hakala U, Loiske L, Vanninen P, Szilvay I. **Separation and structural characterization of a synthetic cannabinoid found in a herbal product using off-line LC-DAD-NMR.** *Analytical Methods* 2011;3(10):2307-2312. [Editor's Notes: Components of seized “herbal products” which could not be identified by GC/MS

analysis were characterized using an off-line LC-DAD-NMR technique. The structural analysis revealed a CP 47,497-C8 homologue type compound. Contact: VERIFIN, University of Helsinki, FIN-00014 Helsinki, Finland.]

4. Murphy TM, Bola G. **DNA identification of Salvia divinorum samples.** Forensic Science International: Genetics 2013;7(1)189-193. [Editor's Notes: Presents title study. Contact: Department of Plant Biology, University of California, Davis, CA 95616, USA.]

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Ali-Tolppa E	Identification of a new amphetamine type stimulant: 3,4-Methylenedioxy-(2-hydroxyethyl)amphetamine (MDHOET).	2005	3	3-4	166-174
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Allred RA.	Synthesis of trans-4-methylaminorex from norephedrine and potassium cyanate.	2005	3	3-4	154-165
Almog J	Evaluation of ninhydrin analogues and other electron-deficient compounds as spray reagents for drugs on thin layer chromatograms.	2003	1	1-2	23-31
Azoury M	Evaluation of ninhydrin analogues and other electron-deficient compounds as spray reagents for drugs on thin layer chromatograms.	2003	1	1-2	23-31
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Berrier AL	The characterization of 2-(3-methoxyphenyl)-2-(ethylamino)-cyclohexanone (methoxetamine).	2012	9	1	3-17

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Bordelon JA	Desloratadine: The reaction byproduct of the reduction of cold tablets containing Loratadine with hydriodic acid/red phosphorus.	2005	3	1-2	69-77
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Bozenko JS	Chiral separation of methamphetamine and related compounds using capillary electrophoresis with dynamically coated capillaries.	2011	8	1	24-28
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Casale JF	Characterization of the "indanylamphetamines."	2005	3	1-2	3-10
Casale JF	Assessment of the volatility (smokeability) of cocaine base containing 50 percent mannitol: Is it a smokeable form of "crack" cocaine?	2005	3	1-4	130-133
Casale JF	Isolation of cis-cinnamoylcocaine from crude illicit cocaine via alumina column chromatography.	2006	4	1-4	37-41

Casale JF	The characterization of 4-methoxy-N-ethylamphetamine hydrochloride.	2006	4	1-4	42-46
Casale JF	Quantitation of cocaine by gas chromatography-flame ionization detection utilizing isopropylcocaine as a structurally related internal standard.	2006	4	1-4	47-53
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Casale JF	The use of dipropionylmorphine as a structurally-related internal standard for gas chromatographic quantitation of heroin.	2008	6	1-2	3-9
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Chong YK	The quantitation of nimetazepam in Erimin-5 tablets and powders by reverse-phase HPLC.	2004	2	1-4	27-33
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Corbeil EM	Identification of levamisole impurities found in illicit cocaine exhibits.	2008	6	3-4	82-89
Corbeil EM	Determination of cocaine in various South American commercial coca products.	2008	6	3-4	109-113
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DiPari SC	Desloratadine: The reaction byproduct of the reduction of cold tablets containing Loratadine with hydriodic acid/red phosphorus.	2005	3	1-2	69-77
Dixon CA	Discovery of an interesting temperature effect on the sensitivity of cobalt thiocyanate test for cocaine.	2008	6	1-2	26-35
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Edwards NR	Qualitative and quantitative analysis of Ionamin 30 capsules (containing a time-release formulation of phentermine).	2006	4	1-4	66-69
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Isopropylcocaine (internal standard for quantitation of cocaine)	Quantitation of cocaine by gas chromatography-flame ionization detection utilizing isopropyl-cocaine as a structurally related internal standard.	2006	4	1-4	47-53
Ketamine (color test)	A new, highly specific color test for ketamine.	2006	4	1-4	24-28
Letrozole (Femara®)	Letrozole (Femara®).	2003	1	3-4	190-195
Levamisole	Levamisole: An analytical profile.	2005	3	3-4	134-137
Levamisole	Identification of levamisole impurities found in illicit cocaine exhibits.	2008	6	3-4	82-89
Levamisole (acetylation impurities in heroin samples)	Identification of levamisole and lidocaine acetylation reaction impurities found in heroin exhibits.	2011	8	1	16-23
Literature Review	Detection and analysis of drugs of forensic interest, 1992 - 2001; A literature review.	2003	1	1-2	55-153
Marijuana (analysis for fatty acids in)	Analysis of fatty acids in marijuana (Cannabis sativa leaf).	2007	5	1-4	20-26
Marijuana (local survey of potency)	Potency of cannabis seized in central Florida during June 2002.	2003	1	1-2	37-39
Marijuana (overview of DNA methods for analysis of)	An overview of DNA methods for the identification and individualization of marijuana.	2003	1	3-4	196-207
Methamphetamine (chiral separation)	Chiral separation of methamphetamine and related compounds using capillary electrophoresis with dynamically coated capillaries.	2011	8	1	24-28
Methamphetamine (isolation from 1-(1',4'-cyclohexadienyl)-2-methylaminopropane)	Isolation of methamphetamine from 1-(1',4'-cyclohexadienyl)-2-methylaminopropane (CMP) using potassium permanganate.	2008	6	1-2	46-54
Methamphetamine (preparation from over-the-counter PSE-containing products)	Laboratory analysis of the conversion of pseudoephedrine to methamphetamine from over-the-counter products.	2005	3	1-2	11-15
Methcathinone Analogues (color tests)	Color tests for the preliminary identification of methcathinone and analogues of methcathinone.	2012	9	1	27-32
Methiopropamine	Methiopropamine: An analytical profile.	2011	8	2	53-57
Methorphan	Rapid chiral separation of dextro- and levo- methorphan using capillary electrophoresis with dynamically coated capillaries.	2005	3	3-4	138-141

Methoxetamine	The characterization of 2-(3-methoxyphenyl)-2-(ethylamino)-cyclohexanone (methoxetamine).	2012	9	1	3-17
Methylenedioxy-2-aminoindans	Characterization of the “methylenedioxy-2-aminoindans.”	2011	8	2	43-52
Mimosa hostilis	The isolation, identification, and quantitation of dimethyl-tryptamine (DMT) in Mimosa hostilis.	2007	5	1-4	41-50
Modafinil	Analytical profile of modafinil.	2005	3	1-2	27-31
N-Acetylbenzocaine (formation via transacetylation)	N-Acetylbenzocaine: Formation via trans-acetylation of benzocaine and acetylsalicylic acid in a cocaine exhibit.	2010	7	1	7-11
Nimetazepam (in Erimin-5 tablets)	The quantitation of nimetazepam in Erimin-5 tablets and powders by reverse-phase HPLC.	2004	2	1-4	27-33
Ninhydrin analogues (as spray reagents for TLC)	Evaluation of ninhydrin analogues and other electron-deficient compounds as spray reagents for drugs on thin layer chromatograms.	2003	1	1-2	23-31
N-Methylphthalimide	The characterization of N-methylphthalimide (NMP).	2011	8	2	36-38
Osmolality	Osmolality - A novel and sensitive tool for detection of tampering of beverages adulterated with ethanol, $\gamma$ -butyrolactone, and 1,4-butanediol, and for detection of dilution-tampered Demerol syringes.	2003	1	1-2	23-31
Palladone (hydromorphone hydrochloride)	Identification and quantitation of hydromorphone hydrochloride in Palladone® (extended time-release) capsules.	2005	3	1-2	39-45
Papaver setigerum (analysis of)	Quantitation of the major alkaloids in opium from Papaver setigerum DC.	2007	5	1-4	13-19
Phenethylamine (imine by-products)	Detection of phenethylamine, amphetamine, and tryptamine imine by-products from an acetone extraction.	2011	8	1	29-35
Phenethylamines and methylenedioxy-amphetamines (analysis by LC-AP-ESI-MS)	Identification of phenethylamines and methylenedioxy-amphetamines using liquid chromatography atmospheric pressure electrospray ionization mass spectrometry.	2005	3	1-2	78-100
Phentermine (in Ionamin 30 capsules)	Qualitative and quantitative analysis of Ionamin 30 capsules (containing a time-release formulation of phentermine).	2006	4	1-4	66-69
Phosphorus (analysis by AccuTOF-DART™)	A rapid technique for the confirmation of iodine and red phosphorus using direct analysis in real time and accurate mass spectrometry.	2010	7	1	3-6
Piperazines	Mass spectra of select benzyl- and phenyl- piperazine designer drugs.	2004	2	1-4	22-26
Propoxyphene	Quantitation and enantiomeric determination of propoxyphene using capillary zone electrophoresis.	2005	3	1-2	31-38
Psilocybe mushroom/chocolate concoctions	A rapid extraction and GC/MS methodology for the identification of psilocyn in mushroom/chocolate concoctions.	2003	1	3-4	177-183
Psilocybin and psilocin (analysis by LC-ESI-MS)	Analysis and characterization of psilocybin and psilocin using liquid chromatography-electrospray ionization mass spectrometry (LC-ESI-MS) with collision-induced-dissociation (CID) and source-induced-dissociation (SID).	2005	3	3-4	175-185
Psychotria viridis	Psychotria viridis - A botanical source of dimethyltryptamine (DMT).	2003	1	1-2	18-22

SWGDRUG	Report of the Scientific Working Group for the Analysis of Seized Drugs (SWGDRUG) conference (Montreal).	2003	1	3-4	208-236
trans-4-Methylaminorex	Synthesis of trans-4-methylaminorex from norephedrine and potassium cyanate.	2005	3	3-4	154-165
Tryptamine (imine by-products)	Detection of phenethylamine, amphetamine, and tryptamine imine by-products from an acetone extraction.	2011	8	1	29-35
Tryptamines	Analytical profiles for five “designer” tryptamines.	2005	3	1-2	54-68
Tryptamines (analysis by ESI-MS)	Analysis and characterization of designer tryptamines using electrospray ionization mass spectrometry (ESI-MS).	2005	3	3-4	107-129

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Email Address:			
Education			
College or University	Degree	Major	
Please Check Which Techniques or Equipment Are Used in Your Laboratory			
<input type="checkbox"/>	Color Tests	<input type="checkbox"/>	UV
<input type="checkbox"/>	Column Chromatography	<input type="checkbox"/>	IR
<input type="checkbox"/>	Microcrystal Tests	<input type="checkbox"/>	CE
<input type="checkbox"/>	Thin Layer Chromatography	<input type="checkbox"/>	GC/MS
<input type="checkbox"/>	GC	<input type="checkbox"/>	Other (please specify)
<input type="checkbox"/>	HPLC	<input type="checkbox"/>	Other (please specify)
Indicate Analytical Problem(s) Nominee Would Like to Have Covered:			
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1st Choice:		2nd Choice:	
Laboratory Chief/Director:			
Printed Name: _____		Signature: _____	
Title: _____		Date: _____	
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January 2013

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## SELECTED REFERENCES

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1. Dal Cason TA, Corbett CA, Poole PK, de Haseth JA, Gouldthorpe DK. **An unusual clandestine laboratory synthesis of 3,4-methylenedioxymphetamine (MDA).** *Forensic Science International* 2012;223(1-3):279-291. [Editor's Notes: unknown compd. from a putative clandestine lab. was analyzed by GC/MS, GC/IRD, FTIR, and NMR and found to be a-methyl-3,4-methylenedioxyphenylpropionamide (MMDPPA), an unusual precursor for the synthesis of 3,4-methylenedioxymphetamine (MDA). A portion of this precursor was subjected to the Hofmann Degradation reaction using a sodium hypochlorite solution to produce MDA. When excess sodium hypochlorite was used in the reaction, a second, unexpected, compound was formed. Use of the listed instrumentation identified the new material as 2-chloro-4,5-methylenedioxyamphetamine, a compound not previously identified in the forensic literature. Contact: DEA North Central Laboratory, IL 60605, USA.]
2. Dunham SJB, Hooker PD, Hyde RM. **Identification, extraction and quantification of the synthetic cannabinoid JWH-018 from commercially available herbal marijuana alternatives.** *Forensic Science International* 2012;223(1-3):241-244. [Editor's Notes: Presents title study. Contact: Westminster College Department of Chemistry, Salt Lake City, UT 84105, USA.]
3. Locos O, Reynolds D. **The characterization of 3,4-dimethylmethcathinone (3,4-DMMC).** *Journal of Forensic Sciences* 2012;57(5):1303-1306. [Editor's Notes: Presents title study. Contact: Illicit Drugs Section, Forensic Science Laboratory, ChemCentre, Bentley, WA 6893, Australia.]
4. Logan BK, Reinhold LE, Xu A, Diamond FX. **Identification of synthetic cannabinoids in herbal incense blends in the United States.** *Journal of Forensic Sciences* 2012;57(5):1168-1180. [Editor's Notes: Presents title study. Contact: NMS Labs, Willow Grove, PA 19090, USA.]
5. Musah Ra, Domin MA, Cody RB, Lesiak AD, John DA, Shepard JRE. **Direct analysis in real time mass spectrometry with collision-induced dissociation for structural analysis of synthetic cannabinoids.** *Rapid Communications in Mass Spectrometry* 2012;26(19):2335-2342. [Editor's Notes: Presents title study. Contact: Department of Chemistry, University at Albany, State University of New York (SUNY), Albany, NY 12222, USA.]
6. Romao W, Sabino BD, Bueno MIMS, Vaz BG, Amadeu C, Maldaner AO, de Castro EVR, Lardeiro RA, Nascentes CC, Eberlin, MN, Augusti R. **LSD and 9,10-dihydro-LSD analyses in street drug blotter samples via easy ambient sonic spray ionization mass spectrometry (EASI-MS).** *Journal of Forensic Sciences* 2012;57(5):1307-1312. [Editor's Notes: Presents title study. Contact: ThoMson Mass Spectrometry Laboratory, Institute of Chemistry, State University of Campinas, Campinas, SP 13084-971, Brazil.]
7. Schaeffer M, Groeger T, Puetz M, Dieckmann S, Zimmermann R. **Comparative analysis of the chemical profiles of 3,4-methylenedioxymphetamine based on comprehensive two-dimensional gas chromatography – time-of-flight mass spectrometry (GC X GC-TOFMS).** *Journal of Forensic Sciences* 2012;57(5):1181-1189. [Editor's Notes: Presents title study. Contact: Joint Spectrometry Center, Cooperation Group Analysis of Complex Molecular Systems, Helmholtz Zentrum Muenchen, Neuherberg 85764, Germany.]
8. Vircks KE, Mulligan CC. **Rapid screening of synthetic cathinones as trace residues and in authentic seizures using a portable mass spectrometer equipped with desorption electrospray ionization.** *Rapid Communications in Mass Spectrometry* 2012;26(23):2665-2672. [Editor's Notes: Presents title study. Contact: Department of Chemistry, Illinois State University, Normal, IL 61790-4160, USA.]

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2. Meyer MR, Peters FT. **Analytical toxicology of emerging drugs of abuse – An Update.** *Therapeutic Drug Monitoring* 2012;34(6):615-621. [Editor's Notes: Presents title study. Contact: Department of Experimental and Clinical Toxicology, Institute of Experimental and Clinical Toxicology, Saarland University, Homburg, Germany Institute of Forensic Medicine, University Hospital Jena, Jena, Germany.]

3. Oestman P, Ketola RA, Ojanperae I. **Application of electrospray ionization product ion spectra for identification with atmospheric pressure matrix-assisted laser desorption/ionization mass spectrometry - A case study with seized drugs.** Drug Testing and Analysis 2013;5(3): 68-73. [Editor's Notes: Presents title study. Contact: University of Helsinki, Hjelt Institute, Department of Forensic Medicine, Finland.]
  
4. Schlatter J, Chiadmi F, Chariot P. **The spice in France: Mixed herbs containing synthetic cannabinoids.** Annales de Biologie Clinique 2012;70(4):413-422. (French) [Editor's Notes: Presents title study. Contact: Laboratoire de toxicologie medicolegale, Hopital Jean-Verdier (AP-HP), Brody, France.]
  
5. Schwaninger AE, Meyer MR, Maurer HH. **Chiral drug analysis using mass spectrometric detection relevant to research and practice in clinical and forensic toxicology.** Journal of Chromatography, A 2012;1269:122-135. [Editor's Notes: Presents title study. Contact: Department of Forensic Pharmacology and Toxicology, Institute of Forensic Medicine, University of Zurich, Zurich, Switzerland.]
  
6. Wallace N, Hueske E, Verbeck GF. **Ultra-trace analysis of illicit drugs from transfer of an electrostatic lift.** Science & Justice 2011;51(4):196-203. [Editor's Notes: Presents title study. Contact: Department of Chemistry, University of North Texas, Denton TX 76203, USA.]

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Email Address:			
Education			
College or University	Degree	Major	
Please Check Which Techniques or Equipment Are Used in Your Laboratory			
<input type="checkbox"/>	Color Tests	<input type="checkbox"/>	UV
<input type="checkbox"/>	Column Chromatography	<input type="checkbox"/>	IR
<input type="checkbox"/>	Microcrystal Tests	<input type="checkbox"/>	CE
<input type="checkbox"/>	Thin Layer Chromatography	<input type="checkbox"/>	GC/MS
<input type="checkbox"/>	GC	<input type="checkbox"/>	Other (please specify)
<input type="checkbox"/>	HPLC	<input type="checkbox"/>	Other (please specify)
Indicate Analytical Problem(s) Nominee Would Like to Have Covered:			
Choice of Seminar Dates:			
1st Choice:		2nd Choice:	
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February 2013

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- Elliott SP, Brandt SD, Freeman S, Archer RP. **AMT (3-(2-aminopropyl)indole) and 5-IT (5-(2-aminopropyl)indole): An analytical challenge and implications for forensic analysis.** *Drug Testing and Analysis* 2013;5(3):196-202. [Editor's Notes: Discusses the differentiation of AMT and the new designer drug 5-IT by NMR, GC/MS, LC, and LC/MS. Contact: Malvern Hills Science Park, ROAR Forensics, Malvern WR14 3SZ, United Kingdom.]
- Fornal E, Stachniuk A, Wojtyla A. **LC-Q/TOF mass spectrometry data driven identification and spectroscopic characterisation of a new 3,4-methylenedioxy-N-benzyl cathinone (BMDP).** *Journal of Pharmaceutical and Biomedical Analysis* 2013;72:139-144. [Editor's Notes: Presents title study. Contact: Chemistry Department, The John Paul II Catholic University of Lublin, 20-718 Lublin, Poland.]
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- Zuba D, Sekula K, Buczek A. **25C- NBOMe - New potent hallucinogenic substance identified on the drug market.** *Forensic Science International* 2013;227(1-3):7-14. [Editor's Notes: Presents title study. Contact: Institute of Forensic Research, Krakow 31033, Poland.]
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- Choe S, Heo S, Choi H, Kim E, Chung H, Lee J. **Analysis of pharmaceutical impurities in the methamphetamine crystals seized for drug trafficking in Korea.** *Forensic Science International* 2013;227(1-3):48-51. [Editor's Notes: Presents title study. Contact: National Forensic Service, Seoul 158-707, South Korea.]
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- Kunalan V, Kerr WJ, NicDaeid N. **Clarification of route specific impurities found in methylamphetamine synthesized using the Birch method.** *Forensic Science International* 2013;223(1-3):321-329. [Editor's Notes: Presents title study. Contact: Centre for Forensic Science, Department of Pure and Applied Chemistry, WestCHEM, University of Strathclyde, Scotland G1 1XW, United Kingdom.]

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Email Address:			
Education			
College or University	Degree	Major	
Please Check Which Techniques or Equipment Are Used in Your Laboratory			
<input type="checkbox"/>	Color Tests	<input type="checkbox"/>	UV
<input type="checkbox"/>	Column Chromatography	<input type="checkbox"/>	IR
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<input type="checkbox"/>	GC	<input type="checkbox"/>	Other (please specify)
<input type="checkbox"/>	HPLC	<input type="checkbox"/>	Other (please specify)
Indicate Analytical Problem(s) Nominee Would Like to Have Covered:			
Choice of Seminar Dates:			
1st Choice:		2nd Choice:	
Laboratory Chief/Director:			
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March 2013

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- Journal of Chromatography, A 2013;1287:84-95. [Editor's Notes: Presents an overview of the strengths and limitations of some of the newest analytical approaches, with particular attention to liquid phase separation techniques coupled to high resolution mass spectrometry. Contact: Department of Molecular Medicine, University Hospital of Padova, Padua, Italy.]
4. Gakkager R, Shimmon R, McDonagh AM. **Synthesis and Impurity profiling of MDMA prepared from commonly available starting materials.** Forensic Science International 2012; 223(1-3):306-313. [Editor's Notes: Presents title study. Contact: Centre for Forensic Science, University of Technology Sydney, Sydney NSW 2007, Australia.]
  5. Rosi L, Frediani P, Bartolucci G. **Determination of  $\gamma$ -hydroxybutyric acid and its precursors ( $\gamma$ -butyrolactone and 1,4-butanediol) in dietary supplements through the synthesis of their isotopologues and analysis by GC-MS method.** Pharmaceutical and Biomedical Analysis 2013; 74:31-38. [Editor's Notes: A method for the determination of  $\gamma$ -hydroxybutyric acid (GHB),  $\gamma$ -butyrolactone (GBL), and 1,4-butanediol (1,4-BD) using isotope dilution mass spectrometry (ID-MS) in dietary supplements is described. Contact: Dipartimento di Chimica "Ugo Schiff", Universita di Firenze, I-50019 Firenze, FI, Italy.]
  6. Stojanovska N, Fu S, Tahtouh M, Kelly T, Beavis A, Kirkbridge KP. **A review of impurity profiling and synthetic route of manufacture of methylamphetamine, 3,4-methylenedioxyamphetamine, amphetamine, dimethylamphetamine and p-methoxyamphetamine.** Forensic Science International 2012;224(1-3):8-26. [Editor's Notes: Presents title review. Contact: Centre for Forensic Science, Sydney, University of Technology, Broadway NSW 2007, Australia.]
  7. Swortwood MJ, Boland DM, DeCaprio AP. **Determination of 32 cathinone derivatives and other designer drugs in serum by comprehensive LC-QQQ-MS/MS analysis.** Analytical and Bioanalytical Chemistry 2013;405(5):1383-97. [Editor's Notes: Presents title study. Contact: Department of Chemistry and Biochemistry and International Forensic Research Institute, Florida International University, Miami, FL 33199, USA.]

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Your Office Mailing Address (include city, state, and zipcode):			Length of Service:
Business Telephone: (     )     -	Business Fax: (     )     -	Date of Application:	
Email Address:			
Education			
College or University	Degree	Major	
Please Check Which Techniques or Equipment Are Used in Your Laboratory			
<input type="checkbox"/>	Color Tests	<input type="checkbox"/>	UV
<input type="checkbox"/>	Column Chromatography	<input type="checkbox"/>	IR
<input type="checkbox"/>	Microcrystal Tests	<input type="checkbox"/>	CE
<input type="checkbox"/>	Thin Layer Chromatography	<input type="checkbox"/>	GC/MS
<input type="checkbox"/>	GC	<input type="checkbox"/>	Other (please specify)
<input type="checkbox"/>	HPLC	<input type="checkbox"/>	Other (please specify)
Indicate Analytical Problem(s) Nominee Would Like to Have Covered:			
Choice of Seminar Dates:			
1st Choice:		2nd Choice:	
Laboratory Chief/Director:			
Printed Name: _____		Signature: _____	
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April 2013

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using LC-TOF and comparison to a synthetic reference standard. Forensic Science International 2013;226(1-3):81-87. [Editor's Notes: The metabolite 3-(3-(1-naphthoyl)-1H-indol-1-yl)propanoic acid (1, JWH-072 N-propanoic acid metabolite) was successfully identified by MS, LC, and chemical derivatization. Full characterization by <sup>1</sup>H NMR, <sup>13</sup>C NMR, FTIR, and HRMS was also conducted. The identity of the metabolite was confirmed against a known reference material. Contact: HQ Air Force Drug Testing Laboratory, Lackland Air Force Base, TX 78236-5310, USA.]

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Your Office Mailing Address (include city, state, and zipcode):			Length of Service:
Business Telephone: (     )     -	Business Fax: (     )     -	Date of Application:	
Email Address:			
Education			
College or University	Degree	Major	
Please Check Which Techniques or Equipment Are Used in Your Laboratory			
<input type="checkbox"/>	Color Tests	<input type="checkbox"/>	UV
<input type="checkbox"/>	Column Chromatography	<input type="checkbox"/>	IR
<input type="checkbox"/>	Microcrystal Tests	<input type="checkbox"/>	CE
<input type="checkbox"/>	Thin Layer Chromatography	<input type="checkbox"/>	GC/MS
<input type="checkbox"/>	GC	<input type="checkbox"/>	Other (please specify)
<input type="checkbox"/>	HPLC	<input type="checkbox"/>	Other (please specify)
Indicate Analytical Problem(s) Nominee Would Like to Have Covered:			
Choice of Seminar Dates:			
1st Choice:		2nd Choice:	
Laboratory Chief/Director:			
Printed Name: _____		Signature: _____	
Title: _____		Date: _____	
Phone: _____			



May 2013

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1. Broseus J, Debrus B, Delemont O, Rudaz S, Esseiva P. **Study of common database feeding with results coming from different analytical methods in the framework of illicit drugs chemical profiling.** Forensic Science International 2013, Ahead of Print, doi: 10.1016/j.forsciint.2013.02.040. [Editor's Notes: Presents title study. Contact: Institut de Police Scientifique, School of Criminal Sciences, University of Lausanne, Lausanne CH-1015, Switzerland.]
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**of low-temperature plasma probes for ambient ionization mass spectrometry.** Rapid Communications in Mass Spectrometry 2013; 27(1):135-142. [Editor's Notes: Presents title study. Contact: Department of Chemistry, Purdue University, West Lafayette, IN 47907-2084 USA.]

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Email Address:			
Education			
College or University	Degree	Major	
Please Check Which Techniques or Equipment Are Used in Your Laboratory			
<input type="checkbox"/>	Color Tests	<input type="checkbox"/>	UV
<input type="checkbox"/>	Column Chromatography	<input type="checkbox"/>	IR
<input type="checkbox"/>	Microcrystal Tests	<input type="checkbox"/>	CE
<input type="checkbox"/>	Thin Layer Chromatography	<input type="checkbox"/>	GC/MS
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1. Chen KF, Lee H, Liu JT, Lee HA, Lin CH. **A microwave-assisted fluorescent labeling method for the separation and detection of amphetamine-like designer drugs by capillary electrophoresis.** Forensic Science International 2013;228(1-3):95-99. [Editor's Notes: The microwave-assisted fluorescent labeling of the 2, 3, and 4-chloroamphetamine and 2, 3, and 4-fluoroamphetamine with fluorescein isothiocyanate isomer I (FITC) is described. A CE/LIF method for the separation and detection of these compounds is also describe and compared to traditional CE and LC/MS methods of analysis. Contact: Department of Chemistry, 88 Sec. 4, National Taiwan Normal University, Taipei, Taiwan.]
2. Kavanagh P, O'Brien J, Fox J, O'Donnell C, Christie R, Power JD, McDermott SD. **The analysis of substituted cathinones. Part 3. Synthesis and characterisation of 2,3-methylenedioxy substituted cathinones.** Forensic Science International 2012;216(1-3):19-28. [Editor's Notes: Presents title study. Contact: Department of Pharmacology and Therapeutics, School of Medicine, Trinity Centre for Health Science, St. James Hospital, Dublin, Ireland.]
3. Power JD, Clarke K, McDermott SD, McGlynn P, Barry M, White C, O'Brien J, Kavanagh P. **The identification of 4-methylamphetamine and its synthesis by-products in forensic samples.** Forensic Science International 2013;228(1-3):

115-131. [Editor's Notes: Presents title study. Contact: Forensic Science Laboratory, Dublin, Ireland.]

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1. Al-Hetlani E. **Forensic drug analysis and microfluidics.** Electrophoresis 2013;34(9-10):1262-1272. [Editor's Notes: Presents title review. Contact: Kuwait University, Department of Chemistry, Safat, Kuwait.]
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3. Ferris TJ, Went MJ. **Synthesis, characterisation and detection of  $\gamma$ -hydroxybutyrate salts.** Forensic Science International 2012;216(1-3):158-162. [Editor's Notes: The sodium, potassium, magnesium, and calcium salts of GHB were synthesized and characterized by FTIR, XRD, and elemental analysis. Contact: School of Physical Sciences, University of Kent, Canterbury, United Kingdom.]
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study. Contact: Institute of Forensic Research, Westerplatte 9, 31-033 Krakow, Poland.]

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6. Lloyd A, Russell M, Blanes L, Doble P, Roux C. **Lab-on-a-chip screening of methamphetamine and pseudoephedrine in samples from clandestine laboratories.** Forensic Science International 2013;228(1-3):8-14. [Editor's Notes: Presents title study. Contact: Centre for Forensic Science, Sydney, University of Technology, Broadway NSW 2007, Australia.]
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Name: (PRINT NAME EXACTLY AS IT IS TO APPEAR ON CERTIFICATE)		Title:	
Employer:			
Your Office Mailing Address (include city, state, and zipcode):			Length of Service:
Business Telephone: (     )     -	Business Fax: (     )     -	Date of Application:	
Email Address:			
Education			
College or University	Degree	Major	
Please Check Which Techniques or Equipment Are Used in Your Laboratory			
<input type="checkbox"/>	Color Tests	<input type="checkbox"/>	UV
<input type="checkbox"/>	Column Chromatography	<input type="checkbox"/>	IR
<input type="checkbox"/>	Microcrystal Tests	<input type="checkbox"/>	CE
<input type="checkbox"/>	Thin Layer Chromatography	<input type="checkbox"/>	GC/MS
<input type="checkbox"/>	GC	<input type="checkbox"/>	Other (please specify)
<input type="checkbox"/>	HPLC	<input type="checkbox"/>	Other (please specify)
Indicate Analytical Problem(s) Nominee Would Like to Have Covered:			
Choice of Seminar Dates:			
1st Choice:		2nd Choice:	
Laboratory Chief/Director:			
Printed Name: _____		Signature: _____	
Title: _____		Date: _____	
Phone: _____			



July 2013

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5. Macher AM, Penders TM. **False-positive phencyclidine immunoassay results caused by 3,4-methylenedioxypyrovalerone (MDPV).** *Drug Testing and Analysis* 2013(2);130-132. [Editor's Notes: Presents title study. Contact: Department of Psychiatric Medicine, Brody School of Medicine, East Carolina University, Greenville, NC, USA.]
6. Nakanishi K, Miki A, Zaitsu K, Kamata H, Shima N, Kamata T, Katagi M, Tatsuno M, Tsuchihashi H, Suzuki K. **Cross-reactivities of various phenethylamine-type designer drugs to immunoassays for amphetamines, with special attention to the evaluation of the one-step urine drug test Instant-View, and the Emit assays for use in drug enforcement.** *Forensic Science*



International 2012;217(1-3):174-181. [Editor's Notes: Presents title study. Contact: Osaka Prefectural Police Headquarters, Forensic Science Laboratory, 1-3-18 Hommachi, Chuo-ward, Osaka, Japan.]

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## THE DEA STATE AND LOCAL FORENSIC CHEMISTS SEMINAR SCHEDULE

The schedule for the DEA State and Local Forensic Chemists Seminar is as follows:

**September 16 - 20, 2013**

**November 4 - 8, 2013**

The school is open only to forensic chemists working for law enforcement agencies. It is intended for chemists who have completed their agency's internal training program and have also been working on the bench for at least one year. There is no tuition charge. The course is held at the Hyatt Place Dulles North Hotel in Sterling, Virginia (near the Washington/Dulles International Airport). A copy of the application form is reproduced on the last page of this issue of Microgram Bulletin. Completed applications should be mailed to the Special Testing and Research Laboratory at 22624 Dulles Summit Court, Dulles, VA 20166. For additional information, send an email to: DEA-Forensic.Chemist.Seminar@usdoj.gov.

<b>DEA State and Local Forensic Chemist Seminar Application</b>			
Name: (PRINT NAME EXACTLY AS IT IS TO APPEAR ON CERTIFICATE)		Title:	
Employer:			
Your Office Mailing Address (include city, state, and zipcode):			Length of Service:
Business Telephone: (     )     -	Business Fax: (     )     -	Date of Application:	
Email Address:			
Education			
College or University	Degree	Major	
Please Check Which Techniques or Equipment Are Used in Your Laboratory			
<input type="checkbox"/>	Color Tests	<input type="checkbox"/>	UV
<input type="checkbox"/>	Column Chromatography	<input type="checkbox"/>	IR
<input type="checkbox"/>	Microcrystal Tests	<input type="checkbox"/>	CE
<input type="checkbox"/>	Thin Layer Chromatography	<input type="checkbox"/>	GC/MS
<input type="checkbox"/>	GC	<input type="checkbox"/>	Other (please specify)
<input type="checkbox"/>	HPLC	<input type="checkbox"/>	Other (please specify)
Indicate Analytical Problem(s) Nominee Would Like to Have Covered:			
Choice of Seminar Dates:			
1st Choice:		2nd Choice:	
Laboratory Chief/Director:			
Printed Name: _____		Signature: _____	
Title: _____		Date: _____	
Phone: _____			

August 2013

# MICROGRAM

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3. Dziadosz M, Weller JP, Klitschar M, Teske J. **Scheduled multiple reaction monitoring algorithm as a way to analyse new designer drugs combined with synthetic cannabinoids in human serum with liquid chromatography-tandem mass spectrometry.** Journal of Chromatography B: Analytical Technologies in the Biomedical and Life Sciences 2013;929:84-89. [Editor's Notes: Presents title study. Contact: Institute of Legal Medicine, Hannover Medical School (MHH), Hannover D-30625, Germany.]
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September 2013

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10. Tyrkkoe E, Pelander A, Ketola RA, Ojanperae I. **In silico and in vitro metabolism studies support identification of designer drugs in human urine by liquid chromatography/quadrupole-time-of-flight mass spectrometry.** *Analytical and Bioanalytical Chemistry* 2013;405(21):6697-6709. [Editor's Notes: Presents title study. Contact: Department of Forensic Medicine, Hjelt Institute, University of Helsinki, Helsinki 00014, Finland.]



October 2013

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Esposito FM, Crumpton S, Mitchell J, Flegel RR. **Evaluation of the 20% d-methamphetamine requirement for determining illicit use of methamphetamine in urine.** *Journal of Analytical Toxicology* 2012;36(6):399-404. [Editor's Notes: Analytical methodology not specified in the abstract. This study includes analyses of OTC inhalers, and considers the optical impurity of the derivatizing reagent N-trifluoroacetyl-L-prolyl chloride. Contact: Center for Forensic Sciences, RTI International, Durham, NC 27709.]

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Holness H, Almirall J. **Speciation effects of solvent chemistry on the analysis of drugs and explosives by electrospray ion mobility mass spectrometry.** *International Journal for Ion Mobility Spectrometry* 2013;16(3):237-246. [Editor's Notes: Studies were conducted in both positive and negative mode ionization, with different solvents and using different levels of acid modifiers. Optimization allowed simultaneous, very rapid analyses of complicated mixtures. Contact: Department of Chemistry and Biochemistry and International Forensic Research Institute, Florida International University, Miami, FL 33199.]

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Kwok K, Taylor LS. **Raman spectroscopy for the analysis of counterfeit tablets.** *Infrared and Raman Spectroscopy in Forensic Science* 2012:561-572. [Editor's Notes: A review on the techniques to detect counterfeit products, and the use of Raman spectroscopy to characterize genuine and counterfeit tablets. Contact: Department of Industrial and Physical Pharmacy, Purdue University, West Lafayette, IN (zip code not provided).]

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**Multi-isotopic analysis as a tool to discriminate between organic and conventional plants.** *Food Chemistry* 2013;141(3):2812-2820. [Editor's Notes: By analysis of stable isotopes of hydrogen, carbon, nitrogen, oxygen, magnesium, and sulfur, as well as nitrogen and oxygen isotope analyses of nitrates, for discrimination of organically and conventionally grown plants. Contact: Plant and Soil Science Section, Department of Plant and Environmental Sciences, Faculty of Science, University of Copenhagen, Thorvaldsensvej 40, DK-1871 Frederiksberg C, Denmark.]

Monakhova YB, Kuballa T, Loebell-Behrends S, Maixner S, Kohl-Himmelseher M, Ruge W, Lachenmeier DW. **Standardless 1H NMR determination of pharmacologically active substances in dietary supplements and medicines that have been illegally traded over the Internet.** *Drug Testing and Analysis* 2013;5(6):400-411. [Editor's Notes: By 400 MHz 1H-NMR, with comparison to literature spectra or against predicted (computational) NMR spectra. Contact: Chemisches und Veterinäruntersuchungsamt (CVUA) Karlsruhe, Karlsruhe, Germany.]

Moosmann B, Hutter M, Huppertz LM, Ferlaino S, Redlingshoefer L, Auwaerter V. **Characterization of the designer benzodiazepine pyrazolam and its detectability in human serum and urine.** *Forensic Toxicology* 2013;31(2):263-271. [Editor's Notes: This article describes the characterization of pyrazolam (8-bromo-1-methyl-6-pyridin-2-yl-4H-[1,2,4]triazolo[4,3-a][1,4]benzodiazepine) by GC/MS, LC-MS/MS, LC-Q-TOF-MS, and NMR. Contact: Institute of Forensic Medicine, Forensic Toxicology Department, University Medical Center Freiburg, Freiburg 79104, Germany.]

Qian Z-h, Xu P, Liu K-l. **Introduction of 2C-series phenethylamines.** Zhongguo Yaowu Lanyong Fangzhi Zazhi 2013;19(2):102-104. [Editor's Notes: A review. This article is written in Chinese. Contact: Institute of Forensic Science, Public Security Ministry, Beijing 100038, Peoples Republic of China.]

Rodrigues NM, Guedes M, Augusti R, Marinho PA. **Cocaine contamination in Belo Horizonte-MG paper currency.** Revista Virtual de Quimica 2013;5(2):125-136. [Editor's Notes: Analysis by HPLC with UV detection. 43 of 50 banknotes were positive for cocaine. This article is written in Portuguese. Contact: Laboratorio de Quimica Legal, Instituto de Criminalistica de Minas Gerais, Belo Horizonte-MG 400, Brazil.]

Schaeffer M, Groeger T, Puetz M, Zimmermann R. **Assessment of the presence of damiana in herbal blends of forensic interest based on comprehensive two-dimensional gas chromatography.** Forensic Toxicology 2013;31(2):251-262. [Editor's Notes: Use of 2D-GC allowed differentiation between damiana and related Tunera species as well as between different batches of damiana. Contact: Joint Mass Spectrometry Centre, Comprehensive Molecular Analytics, Helmholtz Zentrum Muenchen, Neuherberg 85764, Germany.]

Shabalina AE, Kirichek AV, Kaletina NI, Vandshev VV. **The investigation of components in smoking blends containing synthetic cannabinoids RCS-4, JWH-250, CP 47 and 497-C8.** Voprosy Biologicheskoi, Meditsinskoi i Farmatsevticheskoi Khimii 2012;9:67-72. [Editor's Notes: Analyses of "Spice"-like smoking blends by TLC, GC/MS, PLM, and "phytochemical reactions" (to determine the plant components). This article is written in Russian. Contact: 111 Glavnyi Gosudarstvennyi Tsentr Sudebno-Meditsinskikh i Kriminalisticheskikh Ekspertiz, Ministerstva Oborony RF, Moscow, Russia.]

Zamengo L, Frison G, Bettin C, Sciarrone R. Variability of cannabis potency in the Venice area (Italy): **A survey over the period 2010-2012.** Drug Testing and Analysis 2013, Ahead of Print. [Editor's Notes: Analytical methodology not specified in the abstract; about 4000 samples were analyzed. Contact: Laboratory of Environmental Hygiene and Forensic Toxicology,

Regione Veneto, Department of Prevention Veneziana, Venice ULSS12, Italy.]

Zou R, Lou X, Ou H, Zhang Y, Wang W, Yuan M, Guan M, Luo Z, Liu Y. **Highly specific triple-fragment aptamer for optical detection of cocaine.** RSC Advances 2012;2(11):4636-4638. [Editor's Notes: The method allows for sensitive and highly selective detection. Contact: Department of Chemistry, Capital Normal University, Beijing, Peop. Rep. China 100048.]

Zuba D, Byrska B. **Prevalence and co-existence of active components of "legal highs" - Analysis of legal highs' composition.** Drug Testing and Analysis 2013;5(6):420-429. [Editor's Notes: Title may not be correctly translated. Presents the analyses of 449 preparations collected in Poland between mid-2008 and mid-2011, by GC/MS, LC-QTOF-MS, HPLC, and NMR. The most common compounds identified were MPDV, caffeine, butylone, TFMPP, lidocaine, 4-MEC, mephedrone, pFPP, BZP, and MDPBP. Contact: Institute of Forensic Research, Department of Forensic Toxicology, Krakow, Poland.]

#### Additional References of Possible Interest

Barsegyan SS, Purvina EA, Salomatin EM, Sviridova TA, Fedorova TN. **Determination of morphine and codeine in forensic chemical studies with the use of a single quadrupole mass-selective detector coupled to the HPLC system.** Sudebno-Meditsinskaya Ekspertiza 2012;55(6):33-37. [Editor's Notes: For detection and quantitation of morphine and codeine in in "various biological objects." This article is written in Russian. Contact: Bureau of Forensic Medical Expertise, Moscow Health Department, Federal State Budgetary Institution "Russian Centre of Forensic Medical Expertise", Russian Ministry of Health, Moscow, Russia.]

Jayaprakash PT. **Practical relevance of pattern uniqueness in forensic science.** Forensic Science International 2013, Ahead of Print. [Editor's Notes: A discussion of individualization, pattern matching, probability, and uniqueness as mechanisms for error analysis. Contact: Forensic Science Program, Malaysia Forensic Science Program, Universiti Sains Malaysia Kubang Kerian Kelantan 16150, Malaysia.]

November 2013

# MICROGRAM

## BULLETIN

*The U.S. Attorney General has determined that the publication of this periodical is necessary in the transaction of the public business required by the Department of Justice. Information, instruction, and disclaimers can be found at [www.dea.gov](http://www.dea.gov).*

### SELECTED REFERENCES

The Selected References section is a compilation of recent publications of presumed interest to forensic chemists. Unless otherwise stated, all listed citations are published in English. Mailing address information duplicates that which is provided by the abstracting services.

Abdel-Hay KM, DeRuiter J, Randall Clark C. **GC-MS and GC-IRD studies on the six ring regioisomeric dimethoxybenzoylpiperazines (DMBzPs).** Forensic Science International 2013;231(1-3):54-60. [Editor's Notes: The compounds were not identified in the abstract. The perfluoroacyl derivatives of the regioisomers were resolved by GC and their mass spectra showed some differences in relative abundance of fragment ions, but without the appearance of any unique fragments. GC-IRD provides direct confirmatory data for the differentiation between the regioisomeric underivatized dimethoxybenzoylpiperazines. Contact: Department of Pharmacal Sciences, Harrison School of Pharmacy, Auburn University, Auburn, AL 36849.]

Cascini F, Passerotti S, Boschi I. **Analysis of THCA synthase gene expression in Cannabis: A preliminary study by real-time quantitative PCR.** Forensic Science International 2013;231(1-3):208-212. [Editor's Notes: The title study investigated a correlation between THC concentrations in Cannabis and the tetrahydrocannabinol acid synthase (THCAS) gene expression. Contact: Istituto di Sanita Pubblica, Sezione di Medicina Legale, Universita Cattolica del Sacro Cuore, Rome 00168, Italy]

Cletus B, Olds W, Fredericks PM, Jaatinen E, Izake EL. **Real-time detection of concealed chemical hazards under ambient light conditions using Raman spectroscopy.** Journal of Forensic Sciences 2013;58(4):1008-1014. [Editor's Notes: Presents

a modified portable SORS sensor for detecting concealed substances in-field under different background lighting conditions. Applications include drugs (not detailed in the abstract). Contact: School of Chemistry, Physics and Mechanical Engineering, Science and Engineering Faculty, Queensland University of Technology, Brisbane QLD 4001, Australia.]

Deconinck E, Sacre P-Y, Courselle P, De Beer JO. **Chromatography in the detection and characterization of illegal pharmaceutical preparations.** Journal of Chromatographic Science 2013;51(8):791-806. [Editor's Notes: A review of the techniques used to characterize counterfeit and illegal pharmaceuticals, focusing on chromatographic techniques with different detection techniques. Contact: Division of Food, Medicines and Consumer Safety, Section Medicinal Products, Scientific Institute of Public Health (WIV-ISP), Brussels B-1050, Belgium.]

Demoranville LT, Brewer TM. **Ambient pressure thermal desorption ionization mass spectrometry for the analysis of substances of forensic interest.** Analyst 2013;138(18):5332-5337. [Editor's Notes: Presents the title technique. Tested substrates included several explosives and illicit drugs (not specified in the abstract). Very little or no sample prep is needed. Contact: Material Measurement Science Division, National Institute of Standards and Technology, MS-8371, 100 Bureau Dr., Gaithersburg, MD (zip code not provided).]

Dujourdy L, Csesztregi T, Bovens M, Franc A, Nagy J. **Sampling of illicit drugs for quantitative analysis. Part I: Heterogeneity study of illicit drugs in Europe.** Forensic Science International 2013;231(1-3):249-256. [Editor's Notes: It was determined that sampling problems caused by heterogeneity can be solved by using an incremental sampling protocol. This is stated

to be Part I of a planned 3 part study. Contact: Service Central des Laboratoires, Institut National de Police Scientifique, Ecully 69134, France.]

French HE, Went MJ, Gibson SJ. **Graphite furnace atomic absorption elemental analysis of ecstasy tablets.** Forensic Science International 2013;231(1-3):88-91. [Editor's Notes: Copper, magnesium, barium, nickel, chromium, and lead were determined in two separate batches of Ecstasy tablets; large intra-batch variations were found. Contact: School of Physical Sciences, University of Kent, Canterbury CT2 7NH, UK.]

Gaujac A, Martinez ST, Gomes AA, de Andrade SJ, da Cunha Pinto A, David JM, Navickiene S, Andrade JB. **Application of analytical methods for the structural characterization and purity assessment of N,N-dimethyltryptamine, a potent psychedelic agent isolated from Mimosa tenuiflora inner barks.** Microchemical Journal 2013;109:78-83. [Editor's Notes: Describes a simple, rapid method to isolate DMT from Mimosa tenuiflora. Includes characterization by FTIR, MS, MS/MS, 1H- and 13C-NMR, m.p., and UV. Contact: Instituto de Quimica, Universidade Federal da Bahia, 40170-115 Salvador, Brazil.]

Hoonka S, Durgbanshi A, Esteve-Romero J, Dubey NP, Bose D. **Simultaneous determination of three stupefacients in foodstuff using high performance liquid chromatography.** Journal of Liquid Chromatography & Related Technologies 2013, Ahead of Print. [Editor's Notes: PDA detection was used. The "stupefacients" were lidocaine, diazepam, and ketamine. Contact: Department of Criminology and Forensic Science, Dr. Harisingh Gour University, Sagar, India.]

Huang L, Yang X, Qi C, Niu X, Zhao C, Zhao X, Shangguan D, Yang Y. **A label-free electrochemical biosensor based on a DNA aptamer against codeine.** Analytica Chimica Acta 2013;787:203-



210. [Editor's Notes: The presented sensor exhibits high specificity to codeine over morphine. Contact: Chemistry and Chemical Engineering College, Yunnan Normal University, Kunming, Peoples Republic of China 650092.]

Hughes J, Ayoko G, Collett S, Golding G. **Rapid quantification of methamphetamine: Using Attenuated Total Reflectance Fourier Transform Infrared Spectroscopy (ATR-FTIR) and Chemometrics.** PLoS One 2013;8(7):e69609. [Editor's Notes: 96 samples were analyzed; the LOD was 7%. Contact: Discipline of Chemistry, Faculty of Science & Technology, Queensland University of Technology, Brisbane, Queensland, Australia.]

Lopez-Avila V, Zorio M. **Identification of methylhexanamine by GC high-resolution TOF-MS and soft ionization.** Forensic Science International 2013;231(1-3):113-119. [Editor's Notes: Derivatization with trifluoroacetic anhydride and analysis by the title technique differentiated methylhexanamine from the derivatives of 1-aminoheptane, 2-aminoheptane, 1,4-dimethylamylamine, and n-hexylmethylamine. Contact: Agilent Technologies, Santa Clara, CA 95051.]

Lu F, Weng X, Chai Y, Yang Y, Yu Y, Duan G. **A novel identification system for counterfeit drugs based on portable Raman spectroscopy.** Chemometrics and Intelligent Laboratory Systems 2013;127:63-69. [Editor's Notes: Focus is on counterfeit pharmaceuticals. Contact: School of Pharmacy, Fudan University, Shanghai 201203, Peop. Rep. China.]

Lurie IS, Driscoll SE, Cathapermal SS, Panicker S. **Determination of heroin and basic impurities for drug profiling by ultra-high-pressure liquid chromatography.** Forensic Science International 2013;231(1-3):300-305. [Editor's Notes: UHPLC enables enhanced analysis of heroin, morphine, O3- and O6-monoacetylmorphines, codeine, acetylcodeine, noscapine, and papaverine. Contact: Special Testing and Research Laboratory, U.S. Drug Enforcement Administration, Dulles, VA 20166.]

Maldaner AO, Schmidt LL, Locatelli MAF, Jardim WF, Sodre FF, Almeida FV, Pereira CEB, Silva CM. **Estimating cocaine consumption in the Brazilian Federal District (FD) by sewage analysis.** Journal of the Brazilian Chemical Society 2012;23(5):861-867. [Editor's Notes: The analytical methodology was not detailed in the abstract. Contact: Departamento de Policia Federal, Instituto Nacional de Criminalistica, 70610-200 Brasilia, DF, Brazil.]

Masetto de Gaitani C, De Oliveira ARM, Bonato PS. **Capillary electromigration techniques for the analysis of drugs and metabolites in biological matrices: A critical appraisal.** Capillary Electrophoresis and Microchip Capillary Electrophoresis 2013;229-245. [Editor's Notes: A review on strategies to obtain reliable capillary electromigration methods for the analysis of drugs and metabolites, including CE, CEC, and CE on microchips. Selectivity, detectability, efficiency, sample prepn., detectors, and repeatability are discussed. Selected applications are presented. Contact: Department of Pharmaceutical Sciences, University of Sao Paulo, Sao Paulo, Brazil.]

Mazina J, Alekseyev V, Ivkina T, Kaljurand M, Poryvkina L. **Qualitative detection of illegal drugs (cocaine, heroin and MDMA) in seized street samples based on SFS data and ANN: Validation of method.** Journal of Chemometrics 2012;26(8-9):442-455. [Editor's Notes: Presents a spectral fluorescence signature (SFS) method combined with multilayer perceptron artificial neural networks (MLP-ANNs) for detection of the title drugs. Contact: Tallinn University of Technology/NarTest AS, Tallinn, Estonia.]

McKenzie EJ, Miskelly GM, Butler PAG. **Dynamic solid phase microextraction analysis for airborne methamphetamine: Quantitation using isotopically substituted methamphetamine.** Analytical Methods 2013;5(17):4391-4396. [Editor's Notes: Analysis by GC/MS. The results demonstrate that SPME can be used with pre-loaded isotopically substituted methamphetamine as an internal standard for accurate quantitation of airborne methamphetamine. Contact: Forensic Science Programme, School of Chemical Sciences, The University of Auckland, Auckland, N. Z.]

NicDaeid N, Jayaram S, Kerr WJ. **Elemental profiling using ICPMS of methylamphetamine hydrochloride prepared from proprietary medication using the Moscow and hypophosphorous synthesis.** Science & Justice 2013;53(3):278-285. [Editor's Notes: Presents and interprets inorganic profiles to determine within and between batch variations in known provenance samples produced via two different synthetic routes. The presence or absence of elements in the final synthesized products could be linked to the synthesis route, salting out method, and potentially the solvent used in the precursor extraction process. Contact: Centre for Forensic Science, Department of Pure and Applied Chemistry, WestCHEM, University of Strathclyde,

Pagano B, Lauri I, De Tito S, Persico G, Chini MG, Malmendal A, Novellino E, Randazzo A. **Use of NMR in profiling of cocaine seizures.** Forensic Science International 2013;231(1-3):120-124. [Editor's Notes: Presents the title study, as applied to samples seized at (unspecified) different times and places in Naples, Italy. Contact: Department of Pharmacy, University of Naples "Federico II", Naples 80131, Italy.]

Pascual Aguilar JA, Andreu V, Vazquez P, Pico Y. **Presence and spatial distribution of emerging contaminants (drugs of abuse) in protected agroecological systems (L'Albufera de Valencia Coastal Wetland, Spain).** Environmental Earth Sciences 2013, Ahead of Print. [Editor's Notes: The study focused on identifying the presence, flow paths, and spatial distribution of illicit drugs entering the title Natural Park. Analyses were conducted by LC/MS. Contact: Soil Degradation and Conservation Department, CIDE Desertification Research Centre, Valencia 46115, Spain.]

Qian Z-h, Xu P, Liu K-l. **New drug of designer cathinones "Bath Salts."** Zhongguo Yaowu Lanyong Fangzhi Zazhi 2013;19(1):42-44. [Editor's Notes: An overview and review. This article is written in Chinese. Contact: Institute of Forensic Science, Public Security Ministry, Beijing 100038, Peoples Republic of China.]

Rameev B, Mozzhukhin G, Aktas B. **Magnetic resonance detection of explosives and illicit materials.** Applied Magnetic Resonance 2012;43(4):463-467. [Editor's Notes: A review of the use of nuclear quadrupole and magnetic resonance (NQR and NMR) methods for detection of various solid-state and liquid explosive materials, illicit substances, and medicinal counterfeits. Contact: Gebze Institute of Technology, Gebze-Kocaeli, Turkey.]

Sekula K, Zuba D. **Structural elucidation and identification of a new derivative of phenethylamine using quadrupole time-of-flight mass spectrometry.** Rapid Communications in Mass Spectrometry 2013;27(18):2081-2090. [Editor's Notes: Presents characterization of 25I-NBMD [2-(4-iodo-2,5-dimethoxyphenyl)-N-[(2,3-methylenedioxyphenyl)methyl]ethanamine] by LC-ESI-QTOF-MS, GC/MS, and MS/MS. Contact: Institute of Forensic Research, Westerplatte 9, Krakow 31033, Poland.]

Thevis M, Volmer DA. **Recent instrumental progress in mass spectrometry: Advancing resolution,**

**accuracy, and speed of drug detection.** Drug Testing and Analysis 2012;4(3-4):242-245. [Editor's Notes: A review, covering the use of state-of-the-art mass spectrometers and recent instrumental developments such as new and/or improved hybrid analyzers. Contact: German Sport University Cologne, Institute of Biochemistry - Center for Preventive Doping Research, 50933 Cologne, Germany.]

Trzybinski D, Niedzialkowski P, Ossowski T, Trynda A, Sikorski A. **Single-crystal X-ray diffraction analysis of designer drugs: Hydrochlorides of methamphetamine and pentadone.** Forensic Science International 2013, Ahead of Print. [Editor's Notes: The technique allows identification of new substances for which there are no reference standards. Contact: University of Gdansk, Faculty of Chemistry, J. Sobieskiego 18/19, Gdansk 80-952, Poland.]

Tsujikawa K, Kuwayama K, Kanamori T, Iwata YT, Inoue H. **Thermal degradation of alpha-pyrrolidinopentiophenone during injection in gas chromatography/mass spectrometry.** Forensic Science International 2013;231(1-3):296-299. [Editor's Notes: Examines the factors controlling the thermal decomposition of alpha-PVP on GC liners. The use of a new deactivated liner minimized decomposition, even for splitless injections. An enamine compound is proposed for the decomposition product. Contact: National Research Institute of Police Science 6-3-1 Kashiwanoha, Kashiwa, Chiba 277-0882, Japan.]

Uemura N, Fukaya H, Kanai C, Yoshida M, Nakajima J-i, Takahashi M, Suzuki J, Moriyasu T, Nakae D. **Identification of a synthetic cannabinoid A-836339 as a novel compound found in a product.** Forensic Toxicology 2013, Ahead of Print. [Editor's Notes: Presents characterization of N-[3-(2-methoxyethyl)-4,5-dimethyl-2(3H)-thiazolylidene]-2,2,3,3-tetramethylcyclopropanecarboxamide (A-836339) by LC/MS, GC/MS, high-res MS, NMR, and X-ray crystallography. Contact: Tokyo Metropolitan Institute of Public Health, Shinjuku-ku, Tokyo 169-0073, Japan.]

Westwell AD, Hutchings A, Caldicott DGE. **The identification and chemical characterization of a new arylcyclohexylamine, methoxetamine, using a novel emergency department toxicosurveillance**

**tool.** Drug Testing and Analysis 2013;5(3):203-207. [Editor's Notes: Analysis by GC/MS, and <sup>1</sup>H- and <sup>13</sup>C-NMR. Contact: Cardiff School of Pharmacy and Pharmaceutical Sciences, Cardiff University, Cardiff, Wales, UK.]

Wong CHF, Ho ENM, Kwok WH, Leung DKK, Leung GNW, Tang FPW, Wong ASY, Wong JKY, Yu NH, Wan TSM. **Interconversion of ephedrine and pseudoephedrine during chemical derivatization.** Drug Testing and Analysis 2012;4(12):1028-1033. [Editor's Notes: Derivatization of ephedrine/pseudoephedrine with heptafluorobutyric anhydride was found to result in variable diastereomeric interconversion; the authors claim that this conversion has never been previously reported. Analyses were conducted by GC/MS. Toxicological focus. Contact: The Hong Kong Jockey Club, Sha Tin Racecourse, Sha Tin, Racing Laboratory, Hong Kong, Peop. Rep. China.]

Zawilska JB, Wojcieszak J. **Designer cathinones – An emerging class of novel recreational drugs.** Forensic Science International 2013;231(1-3):42-53. [Editor's Notes: An overview and review (abstract mentions mephedrone and MDPV). Contact: Department of Pharmacodynamics, Medical University of Lodz, Lodz 90-151, Poland.]

Zhai W-f, Zhang C-s, Gao L-s. **Study on determination of delta-9-tetrahydrocannabinol in Cannabis by high performance liquid chromatography.** Fenxi Ceshi Xuebao 2012;31(11):1379-1384. [Editor's Notes: Presents the title study. This article is written in Chinese. Contact: Department of Criminal Science and Technology, Chinese People's Public Security University, Beijing 100038, Peoples Republic of China.]

#### Additional References of Possible Interest

Boatto G, Pirisi MA, Burrai L, Baralla E, Demontis MP, Varoni MV, Nieddu M. **An LC-MS-MS method for quantitation of four new phenethylamines (BOX series) in plasma: In vivo application.** Forensic Toxicology 2013, Ahead of Print. [Editor's Notes: Analyses by LC-MS/MS. The four compounds were: 4-Bromo-2,5-beta-trimethoxyphenethylamine (BOB), 4-methyl-2,5-beta-trimethoxyphenethylamine (BOD), 3,4-methylenedioxy-beta-methoxyphenethylamine (BOH), and 4-methyl-2,5-dimethoxy-beta-

hydroxyphenethylamine (BOHD). Toxicological focus. Contact: Dipartimento di Chimica e Farmacia, Universita di Sassari, Sassari 07100, Italy.]

Chen C, Kostakis C, Irvine RJ, White JM. **Increases in use of novel synthetic stimulant are not directly linked to decreased use of 3,4-methylenedioxy-N-methylamphetamine (MDMA).** Forensic Science International 2013;231(1-3):278-283. [Editor's Notes: Wastewater samples were obtained from multiple treatment plants in Adelaide, Australia from 2009 to 2011, and analyzed by SPE-LC-MS/MS. The target compounds were: MDMA, mephedrone, methylone, MDPV, BZP, TFMPP, and methcathinone. The lag time from the decrease in MDMA to the increase in use of the other stimulants, indicated that there was no direct response to the reduction in MDMA use. Contact: Discipline of Pharmacology, School of Medical Sciences, The University of Adelaide, Australia.]

Eiler JM. **The isotopic anatomies of molecules and minerals.** Annual Review of Earth and Planetary Sciences 2013;41:411-441. [Editor's Notes: A review, describing the principles, background, analytical methodologies, existing tools, and likely future progress in this emerging field. Contact: Division of Geological and Planetary Sciences, California Institute of Technology, Pasadena, CA 91125.]

Fenech C, Nolan K, Rock L, Morrissey A. **An SPE LC-MS/MS method for the analysis of human and veterinary chemical markers within surface waters: An environmental forensics application.** Environmental Pollution 2013;181:250-256. [Editor's Notes: The use of co-occurring discriminators was assessed as a means to disentangle sewage and manure sources. Analyses were conducted by SPE-LC-MS/MS. Contact: School of Biotechnology, Dublin City University, Dublin, Ireland.]

Lee E-S, Lee JH, Han KM, Kim JW, Hwang IS, Cho S, Han SY, Kim J. **Simultaneous determination of 38 phosphodiesterase-5 inhibitors in illicit erectile dysfunction products by liquid chromatography-electrospray ionization-tandem mass spectrometry.** Journal of Pharmaceutical and Biomedical Analysis 2013;83:171-178. [Editor's Notes: Describes the development and validation of a

simultaneous analysis method for 38 compounds, including sildenafil, tadalafil, vardenafil and their analogs, in illicit erectile dysfunction products, by LC-ESI-MS/MS. Contact: Advanced Analysis Team, Toxicological Evaluation and Research Department, National Institute of Food and Drug Safety Evaluation, Korea Food & Drug Administration, Osong Health Technology Administration Complex, National Institute of Food and Drug Safety Evaluation, Chungcheongbuk-do, 363-700 S. Korea.]

Murray, Raymond C. **Forensic examination of soils.** Forensic Chemistry Handbook 2012, 109-130. Edited by Kobilinsky, Lawrence. John Wiley & Sons, Inc.: Hoboken, NJ. [Editor's Notes: A review. Contact: University of Montana, Missoula, MT.]

Parsons SM. **Date-rape drugs with emphasis on GHB.** Forensic Chemistry Handbook 2012, 355-434. Edited by Kobilinsky, Lawrence. John Wiley & Sons, Inc.: Hoboken, NJ. [Editor's Notes: A review. The date-rape drugs gamma-hydroxybutyrate (GHB), 3,4-methylenedioxymethamphetamine, flunitrazepam, and ketamine are discussed, with an emphasis on GHB. Contact: Department of Chemistry and Biochemistry, Program in Biomolecular and Engineering, Neuroscience Research Institute, University of California, Santa Barbara, CA.]

**Stable Isotope Forensics: An Introduction to the Forensic Application of Stable Isotope Analysis.** 2011, 296 pages. Edited by Meier-Augenstein, Wolfram. Wiley-Blackwell: Ames, IA.

Sundstroem M, Pelander A, Angerer V, Hutter M, Kneisel S, Ojanperae I. **A high-sensitivity ultra-high performance liquid chromatography/high-resolution time-of-flight mass spectrometry (UHPLC-HR-TOFMS) method for screening synthetic cannabinoids and other drugs of abuse in urine.** Analytical and Bioanalytical Chemistry 2013, Ahead of Print. [Editor's Notes: Toxicological focus. The database consisted of 277 compounds. Contact: Forensic Toxicology Division, Department of Forensic Medicine, Hjelt Institute, University of Helsinki, Helsinki 00014, Finland.]



December 2013

# MICROGRAM BULLETIN

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## SELECTED REFERENCES

The Selected References section is a compilation of recent publications of presumed interest to forensic chemists. Unless otherwise stated, all listed citations are published in English. Mailing address information duplicates that which is provided by the abstracting services.

Cadola L, Broseus J, Esseiva P. **Chemical profiling of different hashish seizures by gas chromatography-mass spectrometry and statistical methodology: A case report.** Forensic Science International 2013, Ahead of Print. [Editor's Notes: Presents the title study. Seven compounds showing high discrimination value were identified. Contact: Institut de Police Scientifique, School of Criminal Sciences, Batochime, University of Lausanne, Lausanne-Dorigny, Switzerland; Institut de Police Scientifique, School of Criminal Sciences 1015, Switzerland.]

Chang Y, Zhang C, Gao L. **Qualitative and quantitative analysis of methcathinone by LC/MS/MS method.** Huaxue Fenxi Jiliang 2013;22(3):51-53. [Editor's Notes: Presents the title analysis. This article is written in Chinese. Contact: Institute of Forensic Science Ministry of Public Security P.R.C, Beijing 100038, Peoples Republic of China.]

Chen H-X, Huang M-H, Zhang X-X. **Micellar electrokinetic chromatography analysis of tetrahydrogestrinone and related anabolic androgenic steroids.** Analytical Methods 2013;5(19):5019-5023. [Editor's Notes: The analytes included two endogenous steroids (testosterone and epitestosterone) and five synthetic steroids (methyltestosterone, nandrolone, gestrinone, dihydrogestrinone and tetrahydrogestrinone). PDA detection was utilized. Toxicological focus, but includes method

development on standards. Contact: Beijing National Laboratory for Molecular Sciences, College of Chemistry, Peking University, Beijing 100871, Peoples Republic of China.]

Djozan D, Farajzadeh MA, Sorouraddin SM, Baheri T. **Determination of methamphetamine, amphetamine and Ecstasy by inside-needle adsorption trap based on molecularly imprinted polymer followed by GC-FID determination.** Microchimica Acta 2012;179(3-4):209-217. [Editor's Notes: Toxicological focus. Contact: Laboratory of Chromatography, Faculty of Chemistry, University of Tabriz, Tabriz, Iran.]

Doctor EL, McCord B. **Comparison of aggregating agents for the surface-enhanced Raman analysis of benzodiazepines.** Analyst 2013;138(20):5926-5932. [Editor's Notes: Eleven different benzodiazepines and metabolites were analyzed, including 1,2-triazolo-benzodiazepines and 1,4-benzodiazepines (none specified in the abstract). Toxicological focus. Contact: Department of Chemistry, Florida International University, Miami (zip code not provided).]

El-Didamony AM, Ali II. **Spectrofluorimetric and spectrophotometric analysis of two analgesic drugs in pharmaceutical formulations and biological fluids.** Journal of Forensic Sciences 2013;58(5):1322-1329. [Editor's Notes: The drugs were tramadol and morphine. Contact: Department of Chemistry, Faculty of Science, Zagazig University, Zagazig 44511, Egypt.]

El-Didamony AM, Khater HM, Ali II. **New sensitive bromatometric assay methods for the determination of four analgesic drugs in pharmaceutical formulations and biological fluids.** Journal of Pharmaceutical Education and

Research 2013;4(1):54-63. [Editor's Notes: The title drugs were nalbuphine, naltrexone, morphine, and tramadol. Contact: Chemistry Department, Faculty of Science, Zagazig University, Zagazig 44519, Egypt.]

Ferreira CR, Wu L, Vogt FG, Bornancini ER, Cooks RG. **Fiducial markers for distribution of drug and excipient on tablet surfaces by Multimodal Desorption Electrospray Ionization - Mass Spectrometry (DESI-MS) imaging.** Analytical Letters 2013, Ahead of Print. [Editor's Notes: Presents the title study; applications include detection of pharmaceutical counterfeits. Contact: Department of Chemistry and Center for Analytical Instrumentation Development, Purdue University, West Lafayette, IN (zip code not provided).]

Forbes TP, Brewer TM, Gillen G. **Desorption Electro-Flow Focusing Ionization of explosives and narcotics for ambient pressure mass spectrometry.** Analyst 2013;138(19):5665-5673. [Editor's Notes: The technique's acronym is DEFFI. The "narcotics" included cocaine (no others were listed in the abstract). Contact: National Institute of Standards and Technology, Materials Measurement Science Division, Gaithersburg, MD (zip code not provided).]

Gross JH. **Direct Analysis in Real Time - A critical review on DART-MS.** Analytical and Bioanalytical Chemistry 2013, Ahead of Print. [Editor's Notes: A review; stated applications include illicit drugs on luggage, clothes, or bank notes. Contact: Institute of Organic Chemistry, Heidelberg University, Heidelberg 69120, Germany.]

Idris M, John C, Ghosh P, Shukla SK, Baggi TRR. **Simultaneous determination of methaqualone, saccharin, paracetamol, and phenacetin in illicit drug samples by HPLC.** Journal of Analytical Science and Technology 2013;4(1-8):4/1-4/6. [Editor's Notes: Present the analysis of "illicit methaqualone samples" by RP-HPLC. Contact: Chemistry Division, Central Forensic Science Laboratory, Hyderabad, India.]

Kanu AB, Brandt SD, Williams MD, Zhang N, Hill HH. **Analysis of psychoactive cathinones and tryptamines by Electrospray Ionization Atmospheric Pressure Ion Mobility Time-of-Flight Mass Spectrometry.** Analytical Chemistry 2013;85(18):8535-8542. [Editor's Notes: Four cathinones (mephedrone, butylone, 4-Me-PPP, and 4-MEC) and five tryptamines (5-EtO-DPT, 5-EtO-DALT, 5-EtO-MIPT, 5-EtO-ALCHT, and 5-EtO-2MALET) were analyzed in less than 1 minute. Contact: Department of Chemistry, Winston-Salem State University, Winston-Salem, NC 27110.]

Leitch O, Anderson A, Kirkbride KP, Lennard C. **Biological organisms as volatile compound detectors: A review.** Forensic Science International 2013;232(1-3):92-103. [Editor's Notes: An overview and review; applications include illicit drugs (not specified in the abstract). Contact: National Centre for Forensic Studies, University of Canberra, Canberra ACT 2617, Australia.]

Lin L, Lv J, Ji Y, Feng J, Liu Y, Wang Z, Zhang W. **Characterization of barbiturates by infrared and Raman microscopy.** Analytical Letters 2013, Ahead of Print. [Editor's Notes: Infrared and confocal Raman microscopy were employed to characterize and discriminate barbital, phenobarbital, pentobarbital, amobarbital, secobarbital, butalbital, pentothal, and butabarbital. Contact: Northeast Petroleum University at Qinhuangdao, Qinhuangdao, Peoples Republic of China.]

Morelato M, Beavis A, Tahtouh M, Ribaux O, Kirkbride P, Roux C. **The use of organic and inorganic impurities found in MDMA police seizures in a drug intelligence perspective.** Science & Justice 2013, Ahead of Print. [Editor's Notes: Comparative analyses were conducted by GC/MS (however, the abstract did not detail how inorganic impurities were analyzed). Contact:

Centre for Forensic Science, University of Technology, Sydney, Broadway, NSW, Australia.]

Nakazono Y, Tsujikawa K, Kuwayama K, Kanamori T, Iwata YT, Miyamoto K, Kasuya F, Inoue H. **Simultaneous determination of tryptamine analogues in designer drugs using gas chromatography-mass spectrometry and liquid chromatography-tandem mass spectrometry.** Forensic Toxicology 2013, Ahead of Print. [Editor's Notes: The analytes were trimethylsilylated prior to analysis by GC/MS and LC-MS/MS. The abstract states 14 tryptamines were analyzed; however, only 5-methoxy-N,N-diethyltryptamine and 5-methoxy-N-methyl-N-isopropyltryptamine (which could not be separated) were specified. Appears to have a toxicological focus. Contact: National Research Institute of Police Science, Kashiwa 277-0882, Japan.]

Nelson MP, Basta A, Patil R, Klueva O, Treado PJ. **Development of a handheld widefield hyperspectral imaging (HSI) sensor for standoff detection of explosive, chemical and narcotic residues.** Proceedings of SPIE 2013;8726(Next-Generation Spectroscopic Technologies VI):872605/1-872605/9. [Editor's Notes: Presents the title study; applications include "locating production facilities of illegal drugs." Contact: ChemImage Sensor Systems, Pittsburgh, PA 15208.]

Nic Daeid N, Savage KA, Ramsay D, Holland C, Sutcliffe OB. **Development of gas chromatography-mass spectrometry (GC-MS) and other rapid screening methods for the analysis of 16 "legal high" cathinone derivatives.** Science & Justice 2013, Ahead of Print. [Editor's Notes: Analyses were conducted using "presumptive testing" (not specified in the abstract), TLC, and GC/MS. Contact: Centre for Forensic Science, Department of Pure and Applied Chemistry, 204 George Street, UK Centre for Forensic Science, University of Strathclyde, Glasgow G1 1XW 1XW, UK.]

Phattanawasin P, Sotaphun U, Sukwattanasinit T, Akkarawarantorn J, Kitchaiya S. **Quantitative determination of sibutramine in adulterated herbal slimming formulations by TLC-image analysis method.** Forensic Science International 2012;219(1-3):96-100. [Editor's Notes: Dragendorff reagent was used for spot detection. The image analysis method was compared against a

TLC-densitometry method. Contact: Faculty of Pharmacy, Silpakorn University, Nakhon Pathom, Thailand.]

Sabin GP, Lozano VA, Rocha WFC, Romao W, Ortiz RS, Poppi RJ. **Characterization of sildenafil citrate tablets of different sources by near infrared chemical imaging and chemometric tools.** Journal of Pharmaceutical and Biomedical Analysis 2013;85:207-212. [Editor's Notes: Allows for detection of counterfeits. Contact: Institute of Chemistry, State University of Campinas, Campinas 13084-971, Brazil.]

Shevyrin V, Melkozerov V, Nevero A, Eltsov O, Shafran Y. **Analytical characterization of some synthetic cannabinoids, derivatives of indole-3-carboxylic acid.** Forensic Science International 2013;232(1-3):1-10. [Editor's Notes: Analyses conducted by GC-HRMS, UHPLC-HRMS, NMR, and FTIR. Compounds not specified in the abstract. Contact: Ural Federal University, Institute of Chemistry and Technology, Yekaterinburg 620002, Russia.]

Siroka J, Polesel DN, Costa JL, Lanaro R, Tavares MFM, Polasek M. **Separation and determination of chlorophenylpiperazine isomers in confiscated pills by capillary electrophoresis.** Journal of Pharmaceutical and Biomedical Analysis 2013;84:140-147. [Editor's Notes: With UV detection. Compounds were 1-(2-chlorophenyl)piperazine (oCPP), 1-(3-chlorophenyl)piperazine (mCPP) and 1-(4-chlorophenyl)piperazine (pCPP). The run buffer contained alpha-cyclodextrin. Contact: Institute of Chemistry, University of Sao Paulo, 05513-970 Brazil.]

Smith JP, Metters JP, Kampouris DK, Lledo-Fernandez C, Sutcliffe OB, Banks CE. **Forensic electrochemistry: The electroanalytical sensing of Rohypnol (flunitrazepam) using screen-printed graphite electrodes without recourse for electrode or sample pre-treatment.** Analyst 2013;138(20):6185-6191. [Editor's Notes: Includes a review of the literature on detection of flunitrazepam. The methodology can detect adulteration of beverages. Contact: Faculty of Science and Engineering, Division of Chemistry and Environmental Science, School of Chemistry and the Environment, Manchester Metropolitan University, Manchester, UK.]

Vani N, Mohan BM, Nagendrappa G. **A new high-performance thin-layer chromatographic method for determination of diazepam in spiked blood samples.** Journal of Planar Chromatography – Modern TLC 2013;26(4):343-348. [Editor's Notes: Presents the use of a new mobile phase for the separation of nitrazepam, clonazepam, lorazepam, chlordiazepoxide, alprazolam, clozapine, and diazepam. The methodology used densitometry and UV scanning. Toxicological focus. Contact: Forensic Science Laboratory, Bangalore 560 068, India.]

Zhai D, Agrawalla BK, Eng PSF, Lee S-C, Xu W, Chang Y-T. **Development of a fluorescent sensor for an illicit date rape drug - GBL.** Chemical Communications 2013;49(55):6170-6172. [Editor's Notes: Claimed to be "the first fluorescent sensor for GBL." Allows for detection of GBL in adulterated beverages. Contact: Department of Chemistry and MedChem Program, Life Sciences Institute, National University of Singapore, Singapore 117543.]

Zuba D, Sekula K. **Analytical characterization of three hallucinogenic N-(2-methoxy)benzyl derivatives of the 2C-series of phenethylamine drugs.** Drug Testing and Analysis 2013;5(8):634-645. [Editor's Notes: The title compounds were: 25D-NBOMe [2-(2,5-dimethoxy-4-methylphenyl)-N-(2-methoxybenzyl)ethanamine], 25E-NBOMe [2-(4-ethyl-2,5-dimethoxyphenyl)-N-(2-methoxybenzyl)ethanamine] and 25G-NBOMe [2-(2,5-dimethoxy-3,4-dimethylphenyl)-N-(2-methoxybenzyl)ethanamine]. Analyses included GC-EI-MS (both underivatized and after derivatization with trifluoroacetic anhydride), LC-ESI-QTOF-MS (and MS/MS), FTIR, and NMR. Contact: Department of Forensic Toxicology, Institute of Forensic Research, Krakow, Poland.]

applications include "pharmaceuticals." The abstract specifically notes facile discrimination of polymorphs. Contact: Ondax Inc., Monrovia, CA 91016.]

**Infrared and Raman Spectroscopy in Forensic Science.** 2012, 618 pages. Chalmers, John M.; Edwards, Howell G. M.; Hargreaves, Michael D.; Editors. John Wiley & Sons Ltd.: Chichester, UK.

#### Additional References of Possible Interest

Heyler RA, Carriere JTA, Havermeier F. **THz-Raman accessing molecular structure with Raman spectroscopy for enhanced chemical identification, analysis and monitoring.** Proceedings of SPIE 2013;8726(Next-Generation Spectroscopic Technologies VI):87260J/1-87260J/7. [Editor's Notes: Introduces a new, inexpensive, and highly efficient approach to gathering ultra-low-frequency Stokes and anti-Stokes Raman spectra (referred to as "THz-Raman");